Cyberbullying in Relation to Adolescents' Dating and Sexual Behaviour: An Evolutionary Psychological Perspective

by

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Abstract

Cyberbullying poses a social concern due to associated psychosocial issues that are experienced by both perpetrators and victims. Despite being associated with these problems, an evolutionary psychological perspective suggests that traditional bullying may be adaptive for some adolescents, engendering greater access to dating and sex by functioning as an intrasexual competition strategy to display preferred mating qualities or to derogate the mating qualities of others. To extend this previous literature, this study examined cyber aggression and victimization in relation to adolescents' dating and sexual behaviour, with biological sex and power balance as moderators. Results suggest that overall cyber victimization was associated with more dating and sexual partners. Furthermore, above and beyond the overall levels of cyber victimization, victimization by equally powerful peers was negatively associated with dating and sexual behaviour, especially for females. Interestingly, frequent cyber perpetration against low-power individuals was detrimental in cyber contexts, especially for males, while frequent cyber victimization by low-power individuals was associated with more dating partners**.** Overall, cyber aggressive behaviours appear linked to dating and sexual behaviour in adolescence, however, there appear to be important differences in the way that cyber and traditional bullying relate to reproductively-relevant outcomes. Furthermore, the results demonstrate the importance of considering not only the frequency of involvement in bullying and victimization, but also the power balance between the perpetrator and the victim, when assessing the effects of cyber aggression.

Keywords: Cyberbullying, Traditional bullying, Aggression, Dating, Sex, Evolutionary theory

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With the rapid advancement of communication technology and increased access to the internet, cyberbullying has become a great social concern in recent years, as technological changes have resulted in bullying no longer being limited to face-to-face social spheres (Dooley, Pyzalski, & Cross, 2009). Research suggests that approximately 1 in 3 adolescents have experienced traditional bullying, either as a bully or victim, while about 16% of adolescents have engaged in cyberbullying, and 15% have been cyber victimized (Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014). Furthermore, studies show that the perpetration of traditional and cyberbullying are, on average, moderately correlated (r = .47), indicating that despite key contextual differences, traditional bullies are likely to perpetrate cyberbullying as well (Modecki et al., 2014).

Both traditional and cyberbullying have been conceptualized as having three main components: (1) the intention to cause harm; (2) aggressive behaviour that occurs in a relationship with a power imbalance favouring the perpetrator (e.g. social, psychological/cognitive, or physical power); and (3) repetition of the behaviour over time (Kowalski, Guimetti, Schroeder, & Lattaner, 2014; Smith et al., 2008; Dooley et al., 2009; Monks & Smith, 2006). Unlike traditional bullying, cyberbullying is enacted through electronic devices, such as the internet and cell phones (Smith et al., 2008). Importantly, some definitions of traditional and cyberbullying specify that they involve proactive aggression, which is consistent with numerous conceptual or theoretical descriptions of bullying as unprovoked, planned, and goal-oriented (Volk, Dane, & Marini, 2014). In support of this perspective, empirical evidence shows that bullies

selectively pick their targets (Langdon & Preble, 2008) and indicates a stronger, more consistent relation between bullying and proactive aggression, rather than with reactive aggression (Volk et al., 2014). Reactive aggression falls outside of some definitions of traditional and cyberbullying because it involves impulsive and emotional reactions to perceived threats, harms, or other frustrations, and therefore is not viewed as planned, goal-directed behaviour. Therefore, in accordance with these perspectives, aggressive attacks (i.e., intentional harm doing) using electronic media should be termed cyber aggression rather than cyberbullying if there is no clear power imbalance between the perpetrator and victim, or if the action is done emotionally and impulsively rather than with a clear purpose.

Due to key contextual differences between traditional and cyberbullying, which will be discussed in depth below, certain aspects of the cyberbullying definition have been questioned. First, investigators have asked whether repetition is necessary for acts of cyber aggression to be considered cyberbullying, as a single aggressive act using electronic devices (e.g., posting an embarrassing picture of a peer online) may remain available for an indeterminate length of time, to be viewed and possibly shared by large numbers of people, and thus may continue to affect the victim long after the initial offence was committed (Volk et al., 2014). Subsequently, even though the act of cyberbullying might not be repeated by the initial offender, the victim may experience chronic distress, as the effects may persist as long as the message, picture or video exists on (and cannot be removed from) the internet. Secondly, the conceptualization and impact of a power imbalance in cyberbullying may differ from that of traditional bullying due to the possibility of anonymous perpetration and because traditional sources of

power, such as physical strength and popularity, may not be required to aggress against someone using an electronic device as the vehicle (Volk et al., 2014). For example, technology may change power balances in favour of individuals with more knowledge of, and ability to use, technology (Dooley et al., 2009) or for individuals with greater verbal intelligence or social skills (see Sutton, Smith, & Swettenham, 1999). However, traditional forms of power may affect the power balance in the cyber context if the perpetrator is not anonymous, and if retaliation through traditional forms of aggression is possible.

Despite differences in conceptualization, both traditional and cyberbullying can be categorized into direct and indirect forms (Dooley et al., 2009). Direct forms include physical bullying, such as hitting or kicking the victim, and verbal bullying, which entails insulting or threatening the victim. Indirect bullying includes relational bullying, in which the perpetrator targets the social reputation or relationships of the victim indirectly through exclusion from social circles or spreading rumours about the victim. Even though cyberbullying is enacted through electronic devices (Smith et al., 2008) and cannot take physical form, it still can still take both direct and indirect forms (Kowalski et al., 2014). Specifically, direct verbal derogation or threatening, and indirect relational bullying (e.g. spreading rumours, excluding, or ignoring victims), can all be enacted with the use of electronic devices. Furthermore, certain acts, such as impersonation, deception, and posting hurtful pictures or videos of others, are unique to cyberbullying (Kowalski et al., 2014).

The nature of communication technology also affords possible advantages to individuals using cyberbullying rather than traditional face-to-face bullying, and poses

special problems for those victimized by this form of bullying. For example, adult sanctions against cyberbullying are less likely because it is difficult for parents or other adults to supervise these communications (Hinduja & Patchin, 2008). Relatedly, bullying by means of communication technology may permit anonymity, making identification and punishment of the perpetrator difficult. Electronic devices also afford easier access to victims, in that perpetration can occur at any time regardless of the victim's location, even when the target is at home. Consequently, whereas victims of traditional bullying at school can escape this negative attention at home on weeknights and weekends, it is much more difficult for victims of cyberbullying to find a safe place away from perpetrators (Hinduja & Patchin, 2008). Finally, as acknowledged in relation to definitional concerns for cyberbullying, repetition of the behaviour is difficult to determine (e.g. Smith et al., 2008; Law, Shapka, Hymel, Olson, & Waterhouse, 2011), and electronic devices may shift power balances, such that technological knowledge, social intelligence, or anonymity may contribute to power in the cyber context more than would traditional sources of power, such as athleticism (Vaillancourt, Hymel, & McDougall, 2003; Sutton et al., 1999).

As aggressive behaviours, both traditional and cyber forms of bullying may be associated with maladaptive outcomes for both the perpetrators and victims. Although the evidence is somewhat mixed, victims and bully-victims (those who are both a bully and victim) of traditional bullying are more likely than pure bullies and uninvolved peers to experience internalizing problems, including depression, anxiety, psychosomatic symptoms, low self-esteem and heightened suicidal ideation (e.g. Gini & Pizzoli, 2009; Holt et al., 2015; Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Ozdemir &

Stattin, 2011). Relatedly, other research found that pure bullying perpetration has generally been not significantly associated, or negatively associated with internalizing symptoms (Ozdemir & Stattin, 2011; Volk, Craig, William, & King, 2006; Ireland, 2005), and pure bullies have even been considered 'psychologically stronger' than non-involved peers (Juvonen, Graham, & Schuster, 2004, pg. 1233).

With respect to cyberbullying in particular, meta-analytic findings suggest that in comparison to cyberbullies, cyber victims were found to experience higher levels of depression, anxiety, loneliness, stress, and suicidal ideation, as well as lower self-esteem and life satisfaction (Kowalski et al., 2014). Consistent with traditional research, cyber bully-victims reported levels of suicidal ideation that were nearly two times greater than those of pure cyberbullies and cyber victims (Bonanno & Hymel, 2013). Therefore, although both traditional and cyber forms of bullying and victimization are related to psychosocial and psychosomatic problems to varying degrees, it appears that bullies may experience fewer internalizing problems than do victims and bully-victims. However, it must be noted that pure traditional bullying perpetration in childhood has been associated with externalizing problems in adolescence and adulthood (Wolke & Leyera, 2015), including perpetration of dating violence (Foshee et al., 2014) and criminality (Ttofi, Farrington, Lösel, & Loeber, 2011).

In the hope of eliminating or reducing the negative outcomes commonly associated with bullying and victimization, many anti-bullying interventions have been developed. Anti-bullying interventions are typically implemented in school settings and include efforts such as assigning social workers within schools, developing whole-school anti-bullying policies, as well as creating programs that involve elements such as social

skills training or education on how to support peers (Merrell, Gueldner, Ross, & Isava, 2008). According to Merrell and colleagues (2008), only about 36% of the school-based interventions evaluated resulted in significantly positive outcomes. In contrast, approximately 60% of the anti-bullying interventions resulted in no meaningful change in bullying behaviours, while another 4% resulted in significant negative effects, suggesting either a worsening, or increased reporting, of bullying behaviours. While this meta-analysis outlines that there are some potential benefits to implementing interventions, the majority of anti-bullying interventions and programs are still not significantly effective. Similarly, intervention and prevention efforts specific to cyber abuse and bullying have generally not resulted in significant changes in risky internet behaviours (e.g., browsing unsafe sites, posting personal information), or the frequency of cyberbullying incidents reported by respondents (Mishna, Cook, Saini, Wu, & MacFadden, 2011). Therefore, it appears modifications or improvements to anti-bullying intervention programs are necessary to effectively reduce traditional and cyberbullying behaviours.

Research on traditional bullying from an evolutionary psychological perspective suggests the benefits of bullying for some perpetrators may limit the effectiveness of anti-bullying interventions. The study of evolutionary psychology has indicated that aggression has been used to solve adaptive problems in humans' evolutionary history (Buss & Shackelford, 1997). This includes the procurement of resources from others, obtaining and maintaining status and power, defense against and prevention of victimization by rivals, as well as competition with intrasexual rivals. Thus, considering the benefits or functions of bullying may help to elucidate why bullying, a behaviour that is maladaptive in some respects, may persist despite seemingly promising interventions.

It is clear from the available literature, discussed in greater detail below, that traditional bullying by adolescents is linked with dating and sexual behaviour (e.g., Dane, Marini, Volk, & Vaillancourt, 2017), and consequently may be an important strategy employed in competition for mates. The purpose of the present study is to extend this line of research by examining cyberbullying and cyber victimization from an evolutionary psychological perspective, to investigate whether this form of bullying may also be associated with such reproductively-relevant behaviours.

An Evolutionary Psychological Perspective on Traditional Bullying

Adaptiveness of bullying. Some researchers have applied an evolutionary psychological perspective to the study of bullying, revealing that bullying may be adaptive for some individuals in certain circumstances (Volk, Camilleri, Dane, & Marini, 2012). In accordance with the theory of natural selection, certain behaviours or traits become adaptive if they increase the likelihood of survival, reproduction and the propagation of genes (Buss, 2012). Thus, due to differential parenting roles in human reproduction described by the parental investment theory, bullying perpetration rates typically vary between the sexes, as do the adaptiveness of the specific forms of bullying (Ellis et al., 2012; Archer, 2009; Bjorklund & Hawley, 2014). In particular, males are more likely than females to partake in high-risk behaviours, such as physical aggression and bullying, as there is greater variance in the number of offspring that males produce; therefore, males have more to gain than females from participating in high-risk behaviours that are likely to improve their reproductive success. In contrast, females require more obligatory parental investment in offspring to ensure survival and the continuation of their genes, making it important for females to avoid harm to ensure their

survival and the propagation of their genes, as the survival of the infant is highly correlated with that of the mother (Vaillancourt, 2013; Campbell, 2013). Subsequently, greater risk aversion has been selected for in females, resulting in females typically utilizing less risky forms of aggression in comparison to males.

The reproductively-relevant functions or benefits of bullying behaviour are best understood within the context of Darwin's theory of sexual selection, which explains adaptations that have proven to increase successful mating (Buss, 2012). According to the theory of sexual selection, adaptations occur in two ways: through *intrasexual competition,* and *intersexual selection*. Intrasexual competition refers to competition between same-sex individuals for desirable mates as well as resource control. For example, aggression or bullying may be used to facilitate intrasexual competition by derogating rivals with a view to reducing their desirability as mates, as well as intimidating rivals into withdrawing from intrasexual competition (e.g. Volk et al., 2012; Leenaars, Dane, & Marini, 2008; Bjorklund & Hawley, 2014; Vaillancourt, 2013). Consistent with this view of bullying as an intrasexual competition strategy, bullying commonly occurs amongst same-sex individuals; indeed, approximately 85% of bullying interactions involve same-sex dyads (Gallup, O'Brien, White, & Wilson, 2009). Furthermore, cross-sex bullying (e.g., males who bully females and vice versa) has been associated with rejection among cross-sex peers, whereas same-sex bullying was not significantly associated with rejection by cross-sex peers (Veenstra, Lindenberg, Munniksma, & Dijkstra, 2010). Thus, bullying appears to be most adaptive when utilized within the context of intrasexual competition.

On the other hand, intersexual selection refers to the process of selecting mates who display certain qualities that have been associated with successful mating (Buss, 2012). Preferred qualities are thought to be indicative of the individuals' ability to successfully reproduce and the wherewithal to provide for and protect offspring, all of which increase the likelihood of being selected as a mate. Accordingly, females are likely to prefer mates who display social status, bravery, strength, and masculinity, which are thought to be representative of resource control capabilities and the ability to provide for and protect offspring. In contrast, males are likely to prefer physical ideals such as a certain hip-to-waist ratio, youthfulness, and sexual fidelity in potential long-term mates, as indicators of their fertility and desire to mate exclusively. Thus, both sexes are attracted to qualities that help to solve adaptive problems (Buss, 2012; Archer, 2009; Campbell, 2013).

Accordingly, physical bullying would theoretically be more adaptive for males than for females, as it serves as a display of strength and dominance to potential mating partners, in accordance with mate preferences that lead to sexual selection, as well as being a signal that deters competitors from targeting them within the context of intrasexual competition (Volk et al., 2012). Similarly, verbal bullying may be utilized to intimidate or harm rivals within intrasexual competition, or signal dominance. In contrast, relational aggression or bullying (e.g., rumour spreading) may be more adaptive for females, as it may be used to affect social relationships and reputations, as well as to derogate preferred qualities of competitors at minimal risk of retaliation due to its covert nature (Campbell, 1999). Overall, bullying forms may be utilized differentially by the

sexes as a tool to successfully engage in intrasexual competition at minimal cost to the perpetrator.

Mechanisms of adaptive bullying. There are several possible mechanisms by which bullying may become adaptive, which may make certain individuals indirectly and probabilistically more willing and able to engage in bullying. In some cases, the development of traits conducive to bullying may be conditional on the developmental environment. While the human species typically utilizes a slow-life history strategy, wherein reproduction is delayed until full maturation is reached (Del Guidice, 2009), life history theory posits that individuals from harsh early environments with limited resources and uncertainty are more likely to utilize a fast-life history strategy which involves engaging in aggressive and risky behaviour for immediate benefits without considering long-term consequences (Ellis et al., 2012). This shift to a riskier strategy may be facilitated by evolved psychological mechanisms, like the attachment system, and potentially through epigenetic changes to gene expression (Del Guidice, 2009). For example, insecure attachment to caregivers has been linked to general aggression, accelerated reproductive development, such as earlier pubertal onset, as well as a developmental shift toward insecure mating strategies (e.g. impulsive mating; Del Guidice, 2009). Additionally, conditional adaptations might also involve evolved psychological mechanisms, like the assessment of relative physical formidability, which allows an individual to assess whether their inherited traits (e.g. personality traits, physical stature) and the current contextual factors (e.g. presence of defenders) interact to suggest bullying would be adaptive within different situations (Buss, 2011).

In contrast, for a select number of predisposed individuals, bullying may be a frequency-dependent and fixed strategy, dependent on the interaction between unchanging heritable personal traits (e.g. callous-unemotional traits, low honesty-humility, physical strength) and the context in which bullying occurs (e.g. presence of defenders versus assistants and reinforcers; Dane et al., 2017). Thus, individuals who possess certain genetically-based traits, such as physical strength or callous unemotionality, may be both willing and able to employ bullying as a strategy to obtain rewards, such as social status and reproductive success, in situations with a favourable cost-benefit ratio. For example, individuals who are willing and able to bully may be more likely to do so when a vulnerable target is available, and when bystanders who are assistants and reinforcers of bullying are present, especially in the absence of defenders (Salmivalli, 2010). Therefore, bullying may only be adaptive for certain individuals who possess traits that facilitate the adaptive use of aggression, and encounter contexts where aggression appears to have a favourable cost-benefit ratio. Thus, all adaptations, including bullying, are only favoured by selection when the benefits outweigh the costs (Buss, 2012).

Victimization by bullying. From an evolutionary psychological perspective, victimization would also be more likely to occur within the context of intrasexual competition (Buss, 2012). On one hand, in the case of physical and verbal bullying, vulnerable individuals are likely to be selected as victims (e.g. Guerra, Williams, & Sadek, 2011), as their selection as targets would lower the cost of the aggression due to reduced likelihood of retaliation or support from peers (see Volk et al., 2012). Thus, the victimization of vulnerable individuals would allow the perpetrator to signal strength and

dominance to peers and potential mates with minimal risk of retaliation or defence by peers, and therefore may facilitate intersexual selection. On the other hand, individuals who display reproductively-relevant behaviours or traits like having more dating and sexual partners, or being physically attractive, are likely to be perceived as rivals and therefore victimized within the context of intrasexual competition (Buss, 2012; Volk et al., 2012).

Gender differences in traditional bullying and victimization. In accordance with natural selection theory and parental investment theory, males tend to perpetrate traditional bullying and aggression more than females (Wang, Iannotti, & Nansel, 2009). Furthermore, males tend to utilize more risky, direct forms of bullying (e.g., physical and verbal), whereas females favour indirect forms (relational bullying), as the risk of harm through retaliation is reduced in comparison to direct forms of confrontation (Wang et al., 2009). However, there are instances in which females benefit from the utilization of physical aggression, including efforts to deter mate poaching by intrasexual competitors, or to retaliate against those to have damaged their reputation (Campbell, 2013). Therefore, when threatened or provoked by a rival, it appears that physical aggression may be a means for females to deter an intrasexual competitor from competition for desirable mates (Vaillancourt, 2013), but possibly at greater cost than for males (e.g., loss of popularity among peers; Cillessen & Mayeux, 2004).

Consistent with sexual selection theory, same-sex verbal bullying tends to target evolutionarily preferred qualities. For example, males' same-sex verbal bullying often focuses on derogating their victim's physical capabilities and access to resources, both of which are qualities preferred by females (Buss & Dedden, 1990). Conversely, females'

same-sex verbal bullying typically involves the derogation their rival's sexual fidelity and physical attractiveness, which are preferred by males (Campbell, 2013).

Reproductively-relevant benefits of traditional bullying. Consistent with evolutionary theories of bullying, traditional bullying in adolescence has been associated with reproductively-relevant benefits, including greater social dominance/status (Vaillancourt et al., 2003; Juvonen et al., 2004), perceived popularity among peers (Thunfors & Cornell, 2008), earlier access to, and more, dating and sexual partners (Connolly, Pepler, Craig, & Taradash, 2000; Vaillancourt, 2013; Volk, Dane, Marini, & Valliancourt, 2015). Furthermore, traditional bullying is associated with earlier pubertal development (Pepler et al., 2006), suggesting that those who tend to utilize risky behaviours, like bullying, are also likely to enter the reproduction phase earlier than those who do not bully. However, it must be noted that the reproductively-relevant benefits associated with bullying behaviours appear dependent on bullying status (Volk et al., 2012). While pure bullies tend to experience more adaptive outcomes with regards to reproductively-relevant benefits as listed above, bully-victims often do not. Rather, previous theory and research has shown that bully-victims are less socially competent, less popular, and disliked by peers (Volk et al., 2012; Dane et al., 2017). Nevertheless, there is some evidence that physical and relational bully-victims experience greater numbers of dating and sexual partners in comparison to uninvolved peers (Dane et al., 2017; Gallup, O'Brien, & Wilson, 2011). Therefore, there is inconsistent evidence as to whether traditional bully-victims gain the reproductively-relevant outcomes that have been linked with traditional pure bullying.

Risks of early dating behaviours. While traditional bullying experiences have been linked to reproductively-relevant behaviours and characteristics, and may therefore be adaptive in an evolutionary sense, earlier and more dating and sexual behaviour relative to age norms may also be associated with negative correlates including declines in psychosocial functioning, such as internalizing and externalizing symptoms, as well as poor motivation and performance in school (Zimmer-Gembeck, Siebenbruner, & Collins, 2001; Meier, 2007). Regardless of these risks, more dating and sexual experience in adolescence would enhance the probability of reproduction. Thus, an evolutionary perspective appears to be applicable to traditional bullying, in that while bullying behaviours may present risks, they may also engender reproductively-relevant benefits, including social status within the peer group and increased opportunities to mate.

Differential effects based on bullying form and biological sex. Consistent with the evolutionary psychological perspective of bullying, the benefits associated with certain traditional bullying forms are found to vary between the sexes. For example, males who physically bully were found to have more dating and sexual partners in comparison to males who did not physically bully, but this difference was not found for females (Dane et al., 2017). In contrast, physically aggressive females tend to have lower levels of perceived popularity and social liking among peers (Cillessen & Mayeux, 2004). Thus, physical aggression may be detrimental for the social reputation of females but facilitative for males, supporting the contention that physical strength or aggression is not a quality that is necessarily valued by males in a female. Conversely, for females, the utilization of relational aggression was associated with earlier and greater access to dating and sexual partners, and higher perceived popularity; however, this relation was not seen

for males (Dane et al., 2017; Vaillancourt, 2013; Cillessen & Mayeux, 2004). Therefore, relational aggression may be more beneficial for females than males, as it is less risky in nature but allows for the derogation of rivals.

With regard to victimization, research suggests that experience of relational victimization increases the risk of negative outcomes to a greater degree for females than males, including lower self-esteem (Carbone-Lopez, Esbensen, & Brick, 2010) and more suicidal behaviours (Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2008), both of which are likely to reduce the individual's desire and capability to participate in intrasexual competition (Vaillancourt, 2013). Overall, the cost-benefit ratio for traditional bullying may be more favourable for males than females, who are less likely to benefit from risky physical behaviours due to the risk of personal harm. However, bullying may be used adaptively by both sexes by utilizing forms with more favourable cost-benefit ratios in accordance with their sex.

Bidirectional relations with bullying. It must be noted that positive relations between aggression, bullying and reproductively-relevant behaviour or characteristics may be bidirectional, such that aggression or bullying can either bring about these benefits, or be triggered by behaviour or characteristics related to sexual activity and reproduction. One possibility is that aggression and bullying may engender a facilitative effect, bringing about reproductively-relevant benefits such as popularity, power and dating opportunities. For example, longitudinal studies found that indirect/relational aggression positively predicted later dating status and perceived popularity in adolescents (Arnocky & Vaillancourt, 2012; Cillessen & Mayeux, 2004). Thus, aggressive

behaviours may facilitate access to reproductively-relevant benefits, like dating opportunities and social status within the peer group.

On the other hand, reproductively-relevant qualities or behaviour may be a trigger for aggression or bullying, partly because they signal greater involvement in competition for mates (e.g. Dane et al., 2017). Therefore, greater involvement with dating and sexual partners may provide a context for bullying being used as a tool to compete for mates, which has been called a competitor effect (Dane et al., 2017). For example, longitudinal research suggests that perceived popularity is a positive predictor of later relational and cyber aggression (Cillessen & Mayeux, 2004; Wright, 2014).

Exemplifying both facilitative and competitor effects for bullying, research suggests that physical and relational aggression have reciprocal and positive longitudinal relations with perceived popularity among early adolescents (Juvonen, Wang, & Espinoza, 2013). This finding indicates that physical and relational aggression at time 1 facilitated greater perceived popularity at time 2, whereas higher perceived popularity at time 1 caused a competitor effect and predicted more physical and relational aggression at time 2. Furthermore, cross-sectional studies could suggest either of these effects, as such studies are unable to establish the direction of causation, though they can illuminate interesting associations which may spur follow-up longitudinal studies to disentangle these relations. One recent cross-sectional study found that having more dating partners was associated with increased odds of females being a relational bully-victim, whereas for males, greater numbers of dating and sexual partners increased the odds of perpetrating physical bullying (Dane et al., 2017). Additionally, greater numbers of dating and sexual partners increased the odds of being a physical bully-victim for both

sexes. Therefore, aggression and bullying may facilitate the attainment of reproductively-relevant behaviours or qualities, or could be a consequence of being perceived as a competitor in the context of intrasexual competition.

Conversely, aggression and bullying may be negatively related to reproductively-relevant behaviours or characteristics, through what may be called detrimental or vulnerability effects. Detrimental effects refer to negative outcomes that result from aggression or bullying. For example, in a longitudinal analysis Cillessen and Mayeux (2004) found that physical and relational aggression predicted lower social preference among peers. Furthermore, an experimental study found that derogation of a females' physical attractiveness by an intrasexual rival was associated with significant decreases in males' ratings of the victim's attractiveness (Fisher & Cox, 2009). A vulnerability effect refers to instances where the individual appears vulnerable (e.g. marginalized in the peer group, absence of defenders) and thus is more likely to engage in aggression due to a deficit or risk factor. For example, longitudinal research found that low social preference at time 1 was associated with increased levels of physical aggression at time 2 (Cillessen & Mayeux, 2004). Further exemplifying either of these two effects, cross-sectional studies suggest that overt aggression is associated with lower perceived popularity, and peer acceptance (Andreou, 2006; Card, Stucky, Sawalani, & Little, 2008). Therefore, aggression and bullying may cause detrimental effects to reproductively-relevant behaviours or qualities, or may occur due to a perceived vulnerability.

Taken together, the literature finds that aggression and bullying have bidirectional and varied associations with reproductively-relevant behaviours and characteristics. Furthermore, examination of the gender differences seen in some studies (e.g., Dane et

al., 2017), suggests that the adaptiveness of some forms of bullying appears to be dependent on biological sex; specifically, females seem to benefit more from relational aggression, while males tend to benefit from physical aggression. Therefore, the results are consistent with an evolutionary psychological perspective supporting the adaptive use of certain bullying forms within the context of intrasexual competition.

Bidirectional relations with victimization. In a similar vein, victimization can have bidirectional relations with reproductively-relevant behaviours and characteristics, as adolescents who are frequently involved with dating and sexual partners are engaging more than peers with less frequent dating and sexual activity in competition for mates. Consequently, adolescents who engage in dating and sexual activity are more likely to be viewed by peers as a rival or competitor, and be victimized in the context of intrasexual competition. As seen with bullying, positive associations between victimization and reproductively-relevant behaviours or characteristics could indicate either a facilitative or competitor effect. Consistent with competitor effects, physical attractiveness and provocative dress have been found to be risk factors for peer victimization of females (e.g., Campbell, 2013; Vaillancourt, 2013; Leenaars et al., 2008; Vaillancourt & Sharma, 2011). Additionally, recent sexual behaviour has been linked to greater odds of indirect victimization amongst older adolescents of both sexes (Leenaars et al., 2008). Indicative of either a competitor or facilitative effect, another study suggested that overall victimization was positively associated with number of sexual partners amongst female respondents (Gallup et al., 2009). Thus, victimization may be the cause or the consequence of reproductively-relevant behaviours or characteristics.

Conversely, victimization may be negatively associated with reproductively-relevant behaviour and characteristics, through detrimental or vulnerability effects. Detrimental effects refer to instances in which victimization results in negative outcomes, while vulnerability effects refer to instances where a vulnerability (e.g. low social status) places an individual at risk for victimization. Illustrating both effects, a longitudinal study found a reciprocal relation between traditional victimization and low popularity for boys, such that traditional victimization at time 1 predicted low popularity at time 2, suggesting a detrimental effect, whereas low popularity at time 1 predicted experience of traditional victimization at time 2, indicating a vulnerability effect (Gradinger, Strohmeier, Schiller, Stefanek, & Spiel, 2012). Indicative of either detrimental or vulnerability effects, cross-sectional studies have found that victimization was negatively associated with number of sexual partners for males (Gallup et al., 2009), while for females, relational victimization was associated with a later debut into dating interactions, and frequent intrasexual victimization was associated with less flirtation with males and lowered perceived physical attractiveness relative to peers (Gallup et al., 2011).

In summary, as with aggression and bullying, victimization appears to be bidirectionally associated, both positively and negatively, with reproductively-relevant behaviours and characteristics. Furthermore, the sex differences in the effect of victimization suggest that females who display evolutionary preferred qualities, like physical attractiveness, are more likely to experience victimization, consistent with intrasexual competition strategies typically used by females. Additionally, males, but not females, who experience victimization are much more likely to experience low status and fewer sexual partners, which may be due to their lack of social dominance, a

characteristic preferred by females. Therefore, it appears that victims of aggression or bullying may be selected either because they are vulnerable and would allow the perpetrator to exert their social dominance, or because they display reproductively-relevant behaviours or traits, and thus the victim is viewed as a competitor.

An Evolutionary Psychological Perspective on Cyberbullying

Adaptiveness of cyberbullying. Theoretically, bullying would have an even more favourable cost-benefit ratio in situations where there is decreased chance of retaliation or punishment. Communication technology may create such an environment, as communication through electronic devices does not necessarily involve face-to-face interaction, and is less regulated than traditional social venues. Furthermore, cyberbullying may inflict more harm onto victims due to its indirect and invasive nature (Campbell, 2005). Of note, the distress caused by cyber victimization has been found to be exacerbated when the victim was unable to determine the identity of the perpetrator, and therefore may result in greater negative outcomes for fear of the unknown perpetrator (Hoff & Mitchell, 2009).

Like traditional bullying, cyberbullying may also facilitate intrasexual competition strategies, such as directly derogating or threatening rivals, or damaging their reputation, which subsequently may affect intersexual selection with minimal risk to the bully (e.g. Hoff & Mitchell, 2009). Conceptualized as a less risky medium for verbal and relational bullying, many researchers initially suggested that females may be more likely than males to cyberbully (e.g. Slonje & Smith, 2008), because females were found to prefer utilizing relational aggression within the domain of traditional bullying (Wang et al., 2009). However, a meta-analysis suggests that males and females are almost equally

likely to perpetrate bullying through technology (r = .04; Barlett & Coyne, 2014), which is consistent with previous research suggesting minimal sex differences in the use of verbal and relational traditional bullying (Wang et al., 2009).

In accordance with intrasexual competition strategies typically seen in traditional bullying, topics of derogation used in same-sex cyberbullying by males include denigrating comments regarding sexual orientation and physical abilities, whereas females typically targeted the sexual reputation and physical appearance of their victims (Hoff & Mitchell, 2009). Additionally, cyberbullying may facilitate intrasexual competition by providing the means to issue threats in efforts to intimidate rivals or deter victimization, and allow for the posting of embarrassing images or videos of a peer in effort to derogate the reputation or relationships of intrasexual rivals. Additionally, as with traditional bullying, the manifestation of reproductively-relevant behaviours and traits may place adolescents at greater risk of engaging in cyber aggressive behaviours or being cyber victimized within the context of intrasexual competition.

Although physical bullying cannot be perpetrated through cyber media, intersexual selection may be facilitated by utilizing verbal and relational aggression with impunity to display social power and dominance over peers. However, it must be noted that certain cyber aggressive acts may be more closely related to intrasexual competition strategies, rather than intersexual selection. Specifically, certain behaviours may not affect the reputation of the perpetrator as much as it would affect the functioning and reputation of the victim. For example, threatening a peer while remaining anonymous would not necessarily result in greater perceived popularity for the perpetrator (unless peers know about or observe the interaction); however, it may result in the victim

withdrawing from intrasexual competition. In fact, victims of cyberbullying, especially females, are likely to experience symptoms of depression (Kowalski et al., 2014), and other internalizing issues (Vaillancourt, 2013). Furthermore, cyber victims of either sex tend to become withdrawn from friends and school, and lose confidence (Hoff & Mitchell, 2009). Thus, victims of cyberbullying are likely to experience issues that may hinder their participation in intrasexual competition, and in turn, indirectly allow more reproductive opportunities for the perpetrator by reducing the numbers of competitors.

Reproductively-relevant benefits of cyberbullying. As with traditional bullying, rates of cyberbullying have not declined substantially despite the development of anti-bullying interventions (Zych, Ortega-Ruiz, & Del Rey, 2015), which may be because cyberbullying also yields adaptive outcomes. A longitudinal study has suggested a facilitative association between cyberbullying and perceived popularity, such that cyberbullies of either sex benefitted from increased perceived popularity among peers (Wegge, Vandebosch, Eggermont, & Pabian, 2016). In contrast, consistent with the differential associations between traditional aggression and bullying and reproductively-relevant outcomes, another longitudinal study found that overall cyber aggression predicted detrimental effects to males' subsequent popularity amongst peers, but produced a facilitative effect for females (Badaly, Kelly, Schwartz, & Dabney-Lieras, 2013). Furthermore, consistent with a competitor effect, popularity has been found to positively predict later overall cyber aggression for both sexes, but more strongly for males than females (Badaly et al., 2013). Relevant to evolutionary theory, the sex differences in relations between cyber aggression and reproductively-relevant characteristics and behaviours may be due to sex differences in the use of forms of

aggression, including greater female reliance on indirect forms (Wang et al., 2009), as females seem to experience a consistent facilitative effect of cyber aggression. Thus, according to preliminary findings, cyberbullying appears to facilitate the attainment of social power and a positive reputation among peers, which could potentially contribute positively to intrasexual competition and intersexual selection by cross-sex individuals.

Likewise, there is preliminary evidence that cyber victimization has been linked to reproductively-relevant behaviour or qualities. For example, in a longitudinal study, cyber victimization at time 1 positively predicted popularity among peers at time 2 for females but not males (Gradinger et al., 2012). This gender difference reflects findings for traditional victimization, such that victimization is more likely to be positively related to reproductively-relevant behaviours or traits for females. In contrast, males seem to be either unaffected or negatively affected by victimization. These findings may reflect the contention that social status is an evolutionarily preferred quality in males (Buss, 2012), and therefore victimized males may be more likely than victimized females to experience reductions in social status due to victimization within the peer group.

Overall, it appears that cyberbullying serves a similar function as traditional bullying, with potential differences due to context. For example, longitudinal research found that cyberbullying, but not traditional bullying, predicted greater perceived popularity for the perpetrator (Wegge et al., 2009). This discrepancy may be attributed to the fact that, unlike traditional bullying, evidence of cyberbullying can be shared only with peers who will not interfere or will support the bullying. Therefore, cyber aggressive behaviours may only affect the perpetrator's perceived popularity among those who observe or know about the cyberbullying behaviours, which could potentially make the

use of cyberbullying more adaptive. Thus, based on theoretical and empirical evidence, it is expected that, like traditional bullying, cyberbullying may also offer advantages with regard to dating and sexual behaviour. The present study was designed to extend previous research by examining the effect of cyberbullying beyond its relation to social status. Specifically, to fill the gap in the literature, this study examines the relation between cyberbullying experiences and dating and sexual behaviours.

Predicted function of cyber aggression and cyberbullying experiences. Since it is predicted that, like traditional aggression, cyber aggression may occur within the context of intrasexual competition, it is expected that experience of cyber aggression, either as a perpetrator or victim, will be associated with greater numbers of dating and sexual partners. As discussed previously, research suggests that traditional aggressors tend to have high levels of dating status and perceived popularity amongst peers (Arnocky & Vaillancourt, 2012; Cillessen & Mayeux, 2004); therefore, it is predicted that pure cyber aggression may also engender similar benefits with regards to dating and sexual experience.

The predicted effect of cyber victimization seems less clear, but as discussed earlier, traditional victimization has been associated with both competitor effects (Vaillancourt & Sharma, 2011; Dane et al., 2017; Leenaars et al., 2008; Gallup et al., 2009; Campbell, 2013; Vaillancourt, 2013) and detrimental effects (Fisher & Cox, 2009; Gallup et al., 2011; Gradinger et al., 2012). It is important to note that the research by Gallup and colleagues (2011) also may have included physical victimization, which would make their findings of detrimental effects less applicable to cyber contexts, wherein physical aggression cannot occur. Overall, it appears that there is more support

of a competitor effect engendering greater traditional victimization for individuals who engage in or display reproductively-relevant behaviours and traits, like dating, having sexual partners, or being physically attractive in the case of females. Therefore, it is predicted that pure cyber victimization would be associated with greater numbers of dating and sexual partners, due to the increased experience of intrasexual competition.

The traditional bullying literature has presented some conflicting findings regarding the effect of bully-victim status on reproductively-relevant benefits (Volk et al., 2012; Dane et al., 2017; Gallup et al., 2011). These discrepant findings may be due in part to the form of bullying or victimization (direct or indirect) studied, the outcome examined (e.g. popularity vs. dating and sexual behaviour), or the biological sex of the perpetrator or victim. Therefore, in the present study, no predictions were made regarding the effect of experiencing both cyberbullying and cyber victimization on dating and sexual involvement. However, in light of previous theory and research suggesting the distinction between pure bullying and bully-victim status is important, interactions between cyberbullying and cyber victimization involvement were examined to explore possible moderating effects.

Another important factor in assessing the effects of cyberbullying, as opposed to cyber aggression, is the existence of a power imbalance. Many research groups utilize a revised form of the common bullying definition, which emphasizes a power imbalance favouring the perpetrator, to measure cyberbullying and victimization (e.g. Cappadocia, Craig, & Pepler, 2013; Smith et al., 2008). This approach involves first providing the respondents with a definition of bullying, and then asking how frequently they have experienced acts of bullying or victimization through technological media. However,

these measures essentially ignore acts of cyber aggression in which the perpetrator and target have roughly equal power, or instances wherein a perpetrator targets a victim with more power than themselves, which might be possible and effective with the use of an anonymous cyber-attack. Likewise, measures of general aggression (not bullying) do not assess the power balance between perpetrator and victim, and therefore lack the information needed to distinguish bullying from other acts of aggression (Volk et al., 2014; Volk, Veenstra, & Espelage, 2017).

This is a critical issue since research suggests that the power balance between a perpetrator and target is an important moderator of relations between acts of aggression and associated outcomes. As discussed previously, it has been argued that the proactive nature of bullying and the careful selection of vulnerable targets may make bullying more adaptive than general aggression (see Dane et al., 2017; Volk et al., 2014). For example, in the case of aggression, research found that aggression was positively associated with peer rejection for both sexes, and negatively related to peer acceptance for boys (Lee, 2009). In contrast, another study differentiated between reactive and proactive aggression to find that proactive aggression was more strongly and significantly correlated with bullying than was reactive aggression, and was frequently the strongest positive predictor of perceived popularity among peers (Prinstein & Cillessen, 2003). Similarly, specific bullying research finds that frequent bullies were more likely to have high perceived popularity at a later measurement time than infrequent bullies and non-involved peers (Reijntjes et al., 2013). Thus, it appears that aggressive behaviour may become more adaptive when the behaviour is proactive and goal directed, rather than reactive, as is the case when the behaviour is classified as bullying.

In further support of bullying being more adaptive than general aggression, research indicates that a power balance favouring the bully over the victim yields greater benefits for the perpetrator. For example, in comparison to moderate- and low-power bullies, high-power bullies were perceived to be more popular and better liked by peers, as well as more attractive (Vaillancourt et al., 2003). Furthermore, the popularity of female aggressors affects potential benefits engendered from overt aggression, such that popular female aggressors were more likely than unpopular female aggressors to have increased dating popularity (Houser, Mayeux, & Cross, 2015). In a similar vein, adolescents with greater social dominance and popularity have been found to be more involved with sexual activity, in comparison to adolescents who are considered to have average or low dominance and popularity (de Bruyn, Cillessen, & Weisfeld, 2012). Additionally, the power held by the aggressor can alter the efficacy of anti-bullying interventions, as the KiVa anti-bullying program was successful in reducing bullying behaviour in individuals with low to moderate popularity, but was unsuccessful for high-popularity bullies (Garrandeau, Lee, & Salmivalli, 2014). Finally, research shows that aggressive behaviour is likely to cause greater harm to the victim's social relationships and psychosocial well-being when the perpetrator holds more power than the victim (Ybarra, Espelage, & Mitchell, 2014; Hunter, Boyle, & Warden, 2007). Thus, bullying may offer a more adaptive cost-benefit ratio than aggression due to the power imbalance favouring the perpetrator, or bullying may be perceived differently by peers and may be less likely to receive negative evaluation, as bullies may select marginalized individuals as victims (e.g. Langdon & Preble, 2008).

Overall, the power imbalance between the bully and the victim appears to be an important factor in determining the degree of harm inflicted on the victim and the potential benefits received by the bully, as high-power perpetration appears to have a more favourable cost-benefit ratio than when acts of aggression are perpetrated by those with less power. If cyberbullying functions similarly to traditional bullying, it may then be expected that the predicted positive association between overall cyber aggression and dating and sexual behaviour would be strongest when the power balance favours the bully (i.e. high-power perpetration). Furthermore, it would also be predicted that high-power perpetration, but not equal- or low-power perpetration, would be positively associated with number of dating and sexual partners.

However, it also likely that equal-, or high-power cyber victimization may be more strongly related to dating and sexual behaviour, as these power balances would more likely indicate intrasexual competition against rivals than low-power victimization, in which the perpetrator is more powerful than the victim. Specifically, intrasexual competition through cyber media may be more likely to involve victimization by equally or less powerful peers against high-power individuals who, by virtue of having equal or higher status, are more likely than less powerful peers to be viewed as intrasexual rivals. Additionally, due to the contextual differences between traditional and cyberbullying, equal- or low-power perpetration through cyber media may minimize the potential harm to the perpetrator, increasing the possibility that these acts could be beneficial. Therefore, equal- and high-power cyber victimization is expected to be associated with more dating and sexual partners. Additionally, the positive relation between overall cyber

victimization and number of dating and sexual partners is expected to be stronger with frequent equal-, or high-power victimization.

Based on the sex differences in the literature reviewed above, females may accrue greater benefits than males from cyber aggression and bullying, as it may serve as a more adaptive means of derogating or threatening intrasexual competitors with minimal risk of harm through physical retaliation. For example, female aggressors and bullies have been found to experience more perceived popularity and less peer rejection in comparison to male aggressors and bullies (Cillessen & Mayeux, 2004; Thunfors & Cornell, 2008; Lee, 2009). Males, in contrast, may benefit more than females from traditional forms of bullying which facilitate intersexual selection (e.g. physical bullying), as physical aggression has been associated with lower social preference and perceived popularity for females, in comparison to males (Cillessen & Mayeux, 2004). Furthermore, physical bully status has been associated with more dating and sexual partners for males, but this relation was unable to be determined for females due to low numbers of female physical bullies involved in dating (Dane et al., 2017). Therefore, since males seem to benefit more from direct aggression, like physical bullying, it is thought that the benefits of cyber aggression and bullying, which exclude the possibility of direct physical aggression, may be less apparent for males when traditional bullying is also considered.

Regarding cyber victimization, the association with dating and sexual behaviour may also be greater for females than males. Research on traditional victimization in relation to reproductively-relevant behaviours and traits suggests that relational victimization was positively related to physical attractiveness, numbers of sexual partners, and earlier sexual debut for females (Leenaars et al., 2008; Gallup et al., 2009).

In contrast, for males, relational victimization in middle school was associated fewer sexual partners, reduced ratings of physical attractiveness, and was not associated with age at sexual debut (Gallup et al., 2009; Leenaars et al., 2008). Finally, in support of both cyber aggression, bullying, and victimization being more strongly associated to dating and sex for females in comparison to males, Dane and colleagues (2017) found that having more dating partners was positively associated with relational bully-victim status for females but not for males. Therefore, since cyber aggression and bullying maybe more closely related to relational and verbal forms, it is predicted that the association between cyber aggressive experiences (either as perpetrator or victim) would be stronger for females than for males.

Purpose

To summarize, the purpose of the current study is to examine the effect of cyber aggression and victimization in relation to dating and sexual experience, as well as assess the effect of various power balances to determine whether the power differential between the perpetrator and the victim is related to reproductively-relevant behaviour above and beyond the effect of frequency of involvement in cyber aggression or victimization. Examining the unique effect of cyber aggression and power differentials will allow for further analysis of the relation between traditional and cyber aggression and bullying in order to determine whether cyber and traditional forms of aggression and bullying function similarly with regards to the facilitation of intrasexual competition. As such, it is hoped that the findings of this research will result in better understanding of the reproductively-relevant benefits associated with cyber aggressive and bullying

behaviours to help inform the creation of more successful anti-bullying intervention programs in the future.

Hypothesis and Predictions

Based on the literature discussed above, this study examined the overall hypothesis that cyber aggression and victimization is associated with dating and sexual behaviour in adolescence, and that the strength of the relation will vary dependent on the power balance between the perpetrator and victim and respondent sex. Data analysis focused on testing the following predictions specific to cyber aggression, bullying, and victimization in relation to dating and sexual behaviour:

1. Perpetration of overall cyber aggression is predicted to be associated with more dating and sexual partners.
2. High-power cyber perpetration is predicted to be associated with more dating and sexual partners, independent of overall levels of cyber aggression.
3. The positive association between overall cyber aggression and number of dating and sexual partners will be stronger with greater utilization of high-power perpetration (i.e. cyberbullying).
4. Overall cyber victimization is predicted to be associated with more dating and sexual partners.
5. Equal-power and high-power cyber victimization are predicted to be associated with more dating and sexual partners, independent of overall levels of cyber victimization.

6. The positive association between overall cyber victimization and number of dating and sexual partners will be stronger with frequent equal-power or high-power victimization.
7. The associations of interest will be stronger for females.

Method

Participants

A sample of 397 participants (230 females) between the ages of 12 to 18 (M = 14.64, SD = 1.52) were recruited from community groups in Southern Ontario, Canada, including athletic organizations, extracurricular organizations, youth and church groups. Within the sample, approximately 81% of participants identified as White, while the remaining 19% included individuals of Asian, Black, Native Canadian, and Mixed ethnicities.

Materials

The participants completed a demographics questionnaire (refer to Appendix A), the Bullying, Aggression, and Victimization Measure (refer to Appendix B), and the Revised Dating and Sex Questionnaire (refer to Appendix C).

The Bullying, Aggression, and Victimization Measure. The Bullying, Aggression, and Victimization Measure was developed by Dane, Marini and Volk (in preparation) to adapt and integrate previous bullying and aggression measures including the Reactive-Proactive Aggression Questionnaire (Raine et al., 2006) and the Forms of Bullying Scale (Book, Volk, & Hosker, 2012), among others (e.g. Little, Jones, Henrich, & Hawley, 2003; Marsee et al., 2011; Shaw, Dooley, Cross, Zubrick, & Waters, 2013; Felix, Sharkey, Green, Furlong, & Tanigawa, 2011; Hunter et al., 2007). This self-report

measure examines the overall frequency with which respondents experienced perpetration and victimization of several forms of aggression, including physical (Perpetration: 8 items, α = .82; Victimization: 7 items, α = .86), verbal (Perpetration: 8 items, α = .80; Victimization: 8 items, α = .91), relational (Perpetration: 9 items, α = .82; Victimization: 8 items, α = .92), and cyber (Perpetration: 9 items, α = .84; Victimization: 9 items, α =.91), during the last 12 months. Respective example items include, 'Got into a physical fight' (physical), 'threatened to physically hurt someone' (verbal), 'spread negative rumours about someone' (relational), and 'I told hurtful lies about someone, using the internet or a cell phone' (cyber). The overall frequency of involvement in the four forms of aggression is rated on a 5-point Likert-type scale ('never' to 'almost every week').

In addition, unlike previous bullying or aggression measures, this measure includes separate items to examine the context in which each form of aggression occurs. Most important to the current study, and in accordance with the defining feature of the bullying definition (Volk et al., 2014), the balance of power between the perpetrator and the victim is assessed. Following the reports of the frequency with which they perpetrate, or are victimized by, each form of aggression, respondents were asked to report the frequency with which they had perpetrated against, or had been victimized by, someone who had (a) less, (b) about the same/equal, and (c) more strength, popularity, or power, than themselves. Therefore, 3 frequency ratings were obtained for both cyber aggression and cyber victimization, one for each potential power balance (e.g. low, equal, more), rated on a 5-point Likert-type scale ranging from 'never' to 'almost always'. Importantly, ratings of high-power perpetration and low-power victimization indicate a power balance

consistent with the definition of bullying, while the remaining power balance ratings would be indicative of non-bullying cyber aggressive behaviours (see Table 1).

Table 1.
Power balance variable names and definitions

Variable Name	Definition
Low-power perpetration	Self-reported cyber aggression perpetrated against an individual with more power than respondent.
Equal-power perpetration	Self-reported cyber aggression perpetrated against an individual with power about equal to that of the respondent.
High-power perpetration	Self-reported cyber aggression perpetrated against an individual with less power than the respondent (i.e. cyberbullying).
Low-power victimization	Self-reported cyber victimization by an individual with more power than the respondent (i.e. cyberbullying).
Equal-power victimization	Self-reported cyber victimization by an individual with power about equal to that of the respondent.
High-power victimization	Self-reported cyber victimization by an individual with less power than the respondent.

Measuring in this way allows an examination of whether the power balance between the perpetrator and victim explains additional variance, through additive or interactive effects, beyond the variance explained by the overall frequency of cyber aggressive behaviour. In other words, the measure can be used to investigate whether (aspects of) the identity of the aggressor and target has explanatory power above and beyond knowing simply what was done. More specifically, this measure will help determine whether there are any differential effects of cyber aggression or cyberbullying with regards to dating and sexual experience.

A preliminary assessment of convergent validity indicated that a composite variable including all four forms of high-power perpetration assessed within the current

measure was positively correlated (r = .36) with a composite measure of multiple forms of bullying measured by using a different method in which respondents indicated the frequency with which they perpetrated various forms of aggressive behaviour specifically and exclusively against victims with less power (Book et al., 2012).

Additionally, the composite measure of low-power victimization (i.e., in which the victim had less power than the perpetrator), including all four forms of victimization, was found to be moderately correlated (r = .52) with Book and colleagues' (2012) measure of bullying victimization (i.e., victimization by a more powerful perpetrator), in which respondents reported the frequency with which they experienced various forms of victimization, but only those instances in which they had less power than the perpetrator. To clarify the distinction between Book and colleagues (2012) methods and that of the present study, it should be noted that their measurement of the frequency of aggression/victimization and balance of power was conflated, while the current study assessed these variables separately.

The Revised Dating and Sex Questionnaire. The Revised Dating and Sex Questionnaire was developed by Dane and colleagues as a measure of dating, sex, and romantic relationships among adolescents, and has been used in previous studies (see Volk et al., 2015; Dane et al., 2017). This measure was derived from two previous measures: (1) the Dating Questionnaire (Connolly, Craig, Goldberg, & Pepler, 2004) and, (2) the Revised Sociosexual Orientation Inventory (Penke & Asendorpf, 2008). Dane and colleagues adapted these measures to include questions regarding group versus dyadic dating, length of dating relationships, and sexual experiences within the short- and long-term. This revised scale utilizes numerous response types, including Likert-type scales

(e.g. ranging from ‘never’ to ‘very often’), open-ended, and multiple-choice answers. Most important to the current study, this measure included an item to assess number of different dating partners (e.g. ‘How many different people have you gone on dates with, just the two of you?’) to increase granularity of the measure for our specific purposes. Additionally, respondents’ sexual experience was assessed, which was defined as ‘more than kissing or making out’ in order to include a broad range of sexual activities (e.g. heavy petting, oral sex, sexual intercourse). Most important to this study, one item assessed the number of sexual partners the respondents have had (e.g. ‘How many different partners have you had a voluntary sexual experience with [i.e., more than kissing or making out] since the age of 12?’).

Procedures

To recruit adolescents between the ages of 12 and 18, we contacted community organizations with programs for youth in southern Ontario. Initial contact was made with the organization or coach through email and/or phone calls. Once approval to speak with the youth was obtained through the organization, a graduate student would attend a meeting with the youth to explain the study and hand out consent form packages to those who volunteered to participate. The packages included two cover letters (refer to Appendix D & E; for parent and adolescent, respectively) to introduce the purpose, methodology, and potential benefits and risks of participating in the overall study, as well as informed parental consent and assent forms (refer to Appendix F & G). The youth were instructed to take the packages home to obtain parental consent and complete personal assent, then participants were directed to an online survey with the link provided in the consent form package, in which they participated in confidentiality with their

assigned identification number. Approximately one week later, the graduate student returned to distribute $15 in compensation to the youth who had completed the survey and had returned signed consent and assent forms.

Plan of Analyses

Using multiple linear regression, cyber aggression, cyber victimization, and power balance variables (i.e. high-, equal-, or low-power perpetration and victimization) predicted the dependent variables, which include number of dating partners and number of sexual partners. Additionally, power balance variables and respondent biological sex were included as moderators.

For each outcome variable, analyses included models in which traditional aggression and victimization are either not controlled (Raw model) or controlled as a covariate (Residualized model). Age and biological sex were entered in step 1, followed cyber aggression and victimization, traditional aggression and victimization, as well as relevant cyber aggression and victimization power balance variables in step 2. Steps 3 and 4 included two- and three-way interactions terms, respectively, to examine interactive relations between cyber aggression, cyber victimization, respondent sex, and power balance variables. The order of variable entry into the raw models was similar to that of the residualized models, but excluded traditional aggression and victimization in step 2. Separate regression analyses were run for each level of power balance (high, equal, low) in regard to the aggression and victimization variables. Significant interactions were then explored using the process outlined by Aiken and West (1991), whereby the simple slopes that make up the interaction were examined at ‘high’ (one standard deviation (SD)

above the mean) and 'low' (one SD below the mean) levels of the predictor and moderator variables included in the interaction. Additive effects involving the power balance variables were examined to determine whether the balance of power between the perpetrator and victim explained variance in dating and sexual behaviour independent of what was done, that is, the overall frequency of aggression and victimization. Furthermore, interactions between the overall frequency of aggression or victimization, and a balance of power variable, would indicate that the relation between aggression or victimization and the adolescents' dating or sexual behaviour depends upon the frequency with which these experiences occurred in the context of a particular power balance, including the extent to which it involved bullying as opposed to general aggression.

Results

Preliminary Analyses

Descriptive statistics of the main variables in the analyses are presented in Table 2, which suggest that cyber and traditional forms of aggression and victimization were relatively low within this sample. Furthermore, it appears that cyberbullying (i.e. high-power perpetration and low-power victimization) occurred less frequently than non-bullying cyber aggression (i.e. equal- and low-power perpetration, as well as high- and equal-power victimization), on average. Finally, dating and sexual experience was highly variable within the sample, with the majority of respondents reporting no dating or sexual experience.

Table 2.
Descriptive statistics for independent, covariate, and dependent variables.

Variable	M	SD	Range
Cyber aggression	1.24	.39	1-5
Traditional aggression	1.35	.33	1-5
Cyber victimization	1.36	.59	1-5
Traditional victimization	1.57	.59	1-5
High-power perpetration	1.23	.58	1-5
Equal-power perpetration	1.47	.79	1-5
Low-power perpetration	1.37	.73	1-5
High-power victimization	1.56	.98	1-5
Equal-power victimization	1.65	.98	1-5
Low-power victimization	1.28	.70	1-5
Number of dating partners	1.16	1.77	0-8
Number of sexual partners	.70	1.74	0-10

Results from the correlational analyses can be seen in Table 3, which suggest that cyber aggression was positively related with age and traditional aggression. These positive relations were also found for cyber victimization, age, and traditional victimization.

Table 3.
Correlations between independent, covariate, and dependent variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	—													
2. Sex	-.05	—												
3. Inc.	-.04	-.04	—											
4. CA	.28***	.02	.14**	—										
5. CV	.16***	.12*	.00	.59***	—									
6. TA	.16***	-.08	.13*	.74***	.55***	—								
7. TV	.04	.09	-.05	.49***	.80***	.58***	—							
8. HP-P.	.17***	.11*	.12*	.54***	.28***	.51***	.27***	—						
9. EP-P.	.26***	.06	.12*	.53***	.35***	.50***	.29***	.48***	—					
10. LP-P.	.19***	.05	.14**	.57***	.47***	.58***	.39***	.47***	.58***	—				
11. HP-V.	.07	.14**	-.02	.37***	.65***	.39***	.66***	.36***	.28***	.47***	—			
12. EP-V.	.16**	.16**	.03	.48***	.66***	.43***	.58***	.35***	.39***	.43***	.55***	—		
13. LP-V.	.14**	.12*	.00	.45***	.51***	.43***	.43***	.33***	.28***	.39***	.29***	.41***	—	
14. # DP	.40***	-.12*	-.01	.29***	.32***	.29***	.23***	.21***	.24***	.26***	.17**	.15**	.17**	—
15. # SP	.32***	-.00	-.12*	.23***	.28***	.23***	.22***	.14*	.24***	.23***	.13*	.13*	.23***	.64***

Note. Inc. = Family Income. CA = Cyber aggression. CV = Cyber victimization. TA = Traditional aggression. TV = Traditional victimization. HP = High-power. EP = Equal-power. LP = Low-power. P. = Perpetration. V. = Victimization. # DP = Number of dating partners. # SP = Number of sex partners.
*p < .05. **p < .01. ***p <.001.

Furthermore, aggression and victimization were also moderately to highly correlated both within and between traditional and cyber forms. Regarding biological sex, correlational analyses found no significant correlation with cyber aggression, however, a small but significant positive correlation was found for cyber victimization, suggesting that females experience more cyber victimization than males, consistent with previous findings (Cappadocia et al., 2013; Holfeld & Leadbeater, 2014). The only other significant correlate was family income, which was significantly, negatively correlated with number of sexual partners, and positively correlated to cyber aggression; thus, family income was controlled within the appropriate regressions.

Table 4 displays findings from correlational analyses specific to males, which found that cyber aggression was not significantly related to any reproductively-relevant variable, while cyber victimization was significantly positively related to number of dating partners. For females, correlations are displayed in Table 5, within which both cyber aggression and cyber victimization were positively correlated with number of dating and sexual partners.

Table 4.
Correlations between independent, covariate, and dependent variables for males.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	—												
2. Inc.	-.10	—											
3. CA	.18*	.22**	—										
4. CV	.04	.08	.63***	—									
5. TA	.08	.16*	.71***	.59***	—								
6. TV	-.04	.01	.49***	.81***	.60***	—							
7. HP-P.	.08	.12	.45***	.29***	.47***	.23**	—						
8. EP-P.	.22**	.04	.41***	.26***	.45***	.23**	.41***	—					
9. LP-P.	.18*	.09	.52***	.55***	.52***	.46***	.39***	.50***	—				
10. HP-V.	.00	.09	.30***	.59***	.36***	.65***	.22**	.22**	.50***	—			
11. EP-V.	.11	.14	.48***	.54***	.44***	.40***	.34***	.38***	.46***	.31***	—		
12. LP-V.	.13	.07	.38***	.51***	.38***	.38***	.25**	.15	.46***	.17*	.38***	—	
13. # DP	.39***	-.12	.14	.23**	.19*	.17*	-.04	.15	.18*	.09	.18*	.12	—
14. # SP	.26**	-.36***	.00	.09	.04	.05	-.05	.11	.10	.00	-.03	.06	.51***

Note. Inc. = Family income. CA = Cyber aggression. CV = Cyber victimization. TA = Traditional aggression. TV = Traditional victimization. HP = High-power. EP = Equal-power. LP = Low-power. P. = Perpetration. V. = Victimization. # DP = Number of dating partners. # SP = Number of sex partners.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 5.
Correlations between independent, covariate, and dependent variables for females.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	—												
2. Inc.	-.02	—											
3. CA	.36***	.01	—										
4. CV	.24***	-.08	.54***	—									
5. TA	.23***	-.00	.73***	.51***	—								
6. TV	.10	-.13*	.44***	.80***	.53***	—							
7. HP-P.	.23***	.07	.52***	.21**	.48***	.19**	—						
8. EP-P.	.30***	.12	.56***	.36***	.49***	.26***	.47***	—					
9. LP-P.	.20***	.12	.54***	.38***	.57***	.30***	.44***	.59***	—				
10. HP-V.	.13	-.10	.37***	.65***	.38***	.62***	.37***	.28***	.43***	—			
11. EP-V.	.21**	.07	.46***	.69***	.41***	.65***	.29***	.36***	.37***	.64***	—		
12. LP-V.	.16*	-.11	.41***	.46***	.39***	.39***	.26***	.27***	.29***	.28***	.38***	—	
13. # DP	.43***	.02	.34***	.38***	.26***	.21**	.32***	.27***	.27***	.19**	.11	.15*	—
14. # SP	.39***	-.02	.29***	.36***	.22***	.24***	.12	.25***	.23***	.13	.18*	.22**	.69***

Note. Inc. = Family income. CA = Cyber aggression. CV = Cyber victimization. TA = Traditional aggression. TV = Traditional victimization. HP = High-power. EP = Equal-power. LP = Low-power. P = Perpetration. V = Victimization. # DP = Number of dating partners. # SP = Number of sex partners.
*$p < .05$. **$p < .01$. ***$p < .001$.

In order to control for traditional forms of aggression and victimization, correlational and reliability analyses were run to determine if composite variables could be created including all traditional forms of perpetration or victimization (e.g. physical, verbal, and relational). Correlational analyses found weak to moderate positive correlations between the three traditional forms of aggression (*r* range from .26 to .59), and weak to strong positive correlations for victimization forms (*r* range from .37 to .78). High reliabilities were found for composites of traditional forms of aggression ($\alpha = .89$) and victimization ($\alpha = .95$); Thus, two composites were created for traditional aggression and victimization for entry into the regression models.

Regression Analyses

Number of dating partners.

High-power. **As** shown in Table 6, in the regression with high-power balance of power variables, overall cyber aggression was not significantly associated with number of reported dating partners, however overall cyber victimization was significantly positively related to number of dating partners in both the raw and residualized models (residualized models refer to those that control traditional bullying and victimization within the regression model). Interaction effects were similar between raw and residualized models, thus, unless stated otherwise, interpretations of interactions are based on the residualized models.

Table 6.
Cyber aggression, cyber victimization, high-power, and control variables in relation to number of dating partners.

		Model 1 – Raw				Model 2 - Residualized			
		β	sr^2	R^2	ΔR^2	β	sr^2	R^2	ΔR^2
Predictors									
1				.17	.17***			.17	.17***
	Age	.39***	.15			.39***	.15		
	Sex	-.13*	.02			-.13*	.02		
2				.23	.06***			.23	.06***
	CA	-.01	.00			-.04	.00		
	TA					.08	.00		
	CV	.26***	.03			.33***	.03		
	TV					-.12	.00		
	HP-Perp	.09	.00			.08	.00		
	HP-Vic	-.08	.00			-.07	.00		
3				.26	.03			.27	.04*
	CA x Sex	-.07	.00			-.05	.00		
	CV x Sex	-.03	.00			-.06	.00		
	HP-Perp x Sex	.35**	.02			.36**	.02		
	HP-Vic x Sex	-.09	.00			-.10	.00		
	CA x CV	-.03	.00			-.05	.00		
	CA x HP-Perp	.03	.00			.02	.00		
	CV x HP-Vic	.13	.00			.17*	.01		
4				.30	.04**			.31	.04***
	CA x CV x Sex	.19	.00			.21	.00		
	CA x HP-Perp x Sex	.56*	.01			.52*	.01		
	CV x HP-Vic x Sex	-.21	.00			-.21	.00		
	CA x CV x HP-Perp	.23*	.01			.23*	.01		
	CV x CA x HP-Vic	-.07	.00			-.09	.00		

Note. CA = Cyber aggression. TA = Traditional aggression. CV = Cyber victimization. TV = Traditional victimization. HP-Perp = High-power perpetration. HP-Vic = High-power victimization.
*p < .05. **p < .01. ***p <.001.

In the residualized model in table 6, there was a significant two-way interaction between overall cyber victimization and high-power victimization, $t(304) = 2.32$, $p = .026$. As shown in Figure 1, the nature of the interaction suggests that the positive association between overall cyber victimization and number of dating partners was only significant in the case of frequent high-power victimization (i.e. cyber victimization by individual with less power than the respondent (victim); $\beta = .49$, $sr^2 = .02$, $p = .003$), as opposed to infrequent high-power victimization ($\beta = .24$, $sr^2 = .00$, $p = .073$).

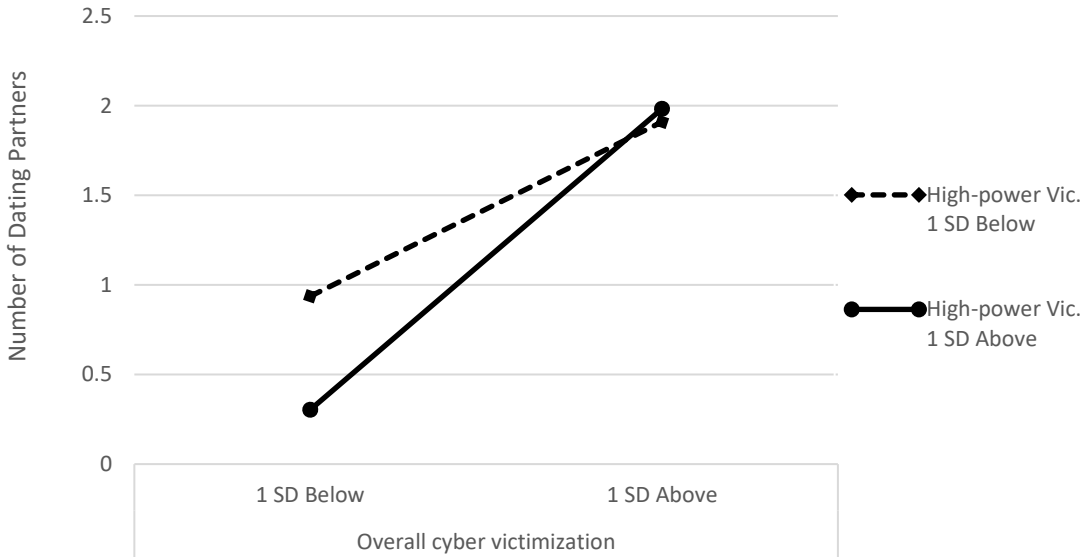

Figure 1. Frequency of high-power cyber victimization as moderator of relation between overall cyber victimization and number of dating partners.

Furthermore, there were two significant three-way interactions. One significant interaction involved high-power perpetration by overall cyber aggression by sex, $t(299) = 2.20$, $p = .029$. As shown in Figure 2, this interaction suggests that for males, high-power perpetration (i.e. cyberbullying against individual with less power than respondent) was negatively related to number of dating partners when overall cyber aggression was frequently utilized ($\beta = -.26$, $sr^2 = .01$, $p = .019$); in contrast, the relation was positive, but non-significant with infrequent use of overall cyber aggression ($\beta = .39$, $sr^2 = .00$, $p =$

.143). For females, the relation between high-power perpetration and number of dating partners was significantly positive when overall cyber aggression was frequently utilized ($\beta = .21$, $sr^2 = .02$, $p = .004$), but not significant with infrequent overall cyber aggression ($\beta = .10$, $sr^2 = .00$, $p = .447$).

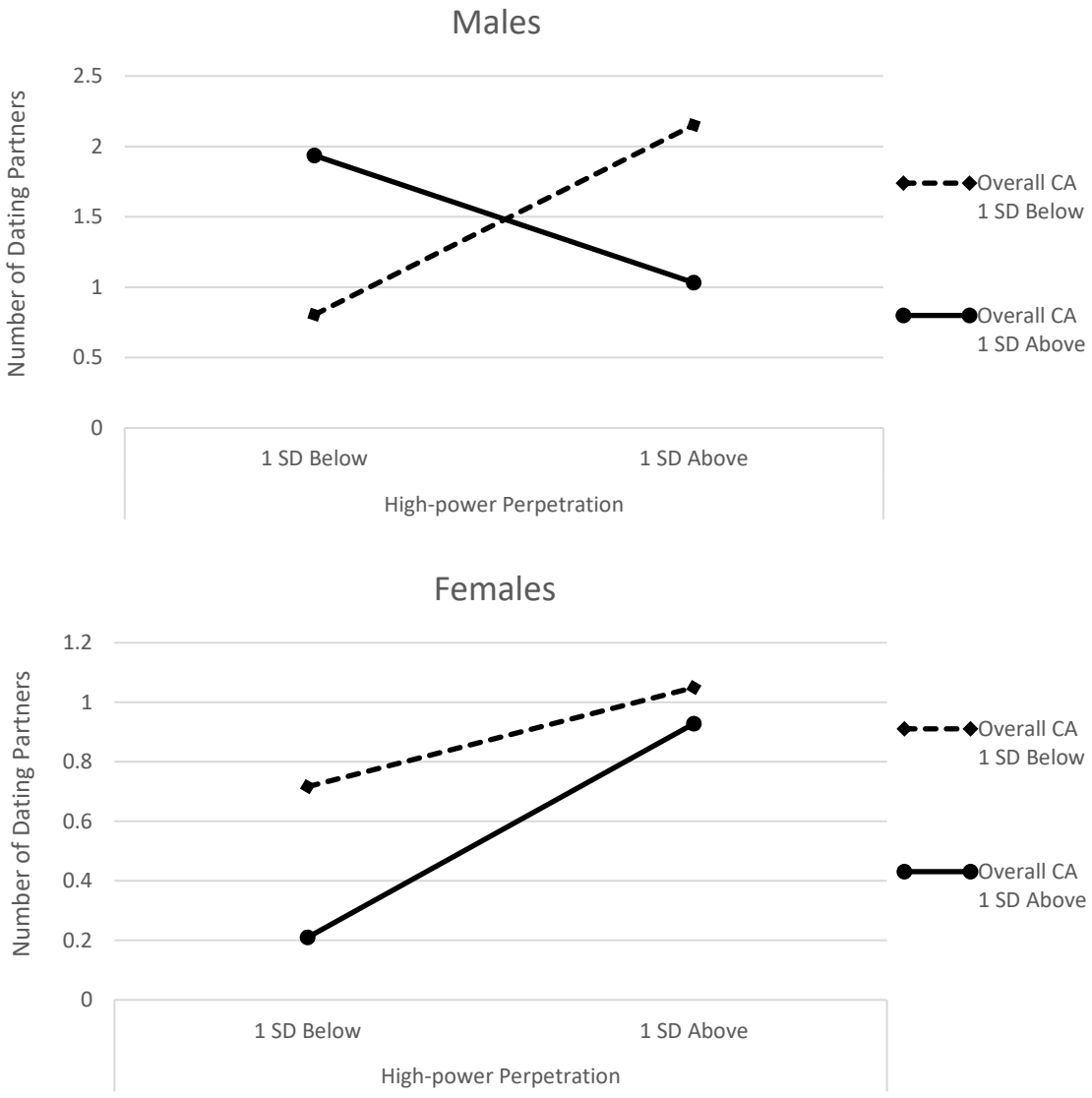

Figure 2. Frequency of high-power perpetration and sex as moderators of the relation between overall cyber aggression and number of dating partners.

The second significant three-way interaction within this model indicated that overall cyber aggression interacted with overall cyber victimization and high-power perpetration $t(299) = 2.44$, $p = .015$. Figure 3 displays this interaction, showing that at low levels of overall cyber victimization, overall cyber aggression was significantly positively related to number of dating partners when high-power perpetration was infrequently used ($\beta = .65$, $sr^2 = .02$, $p = .002$),

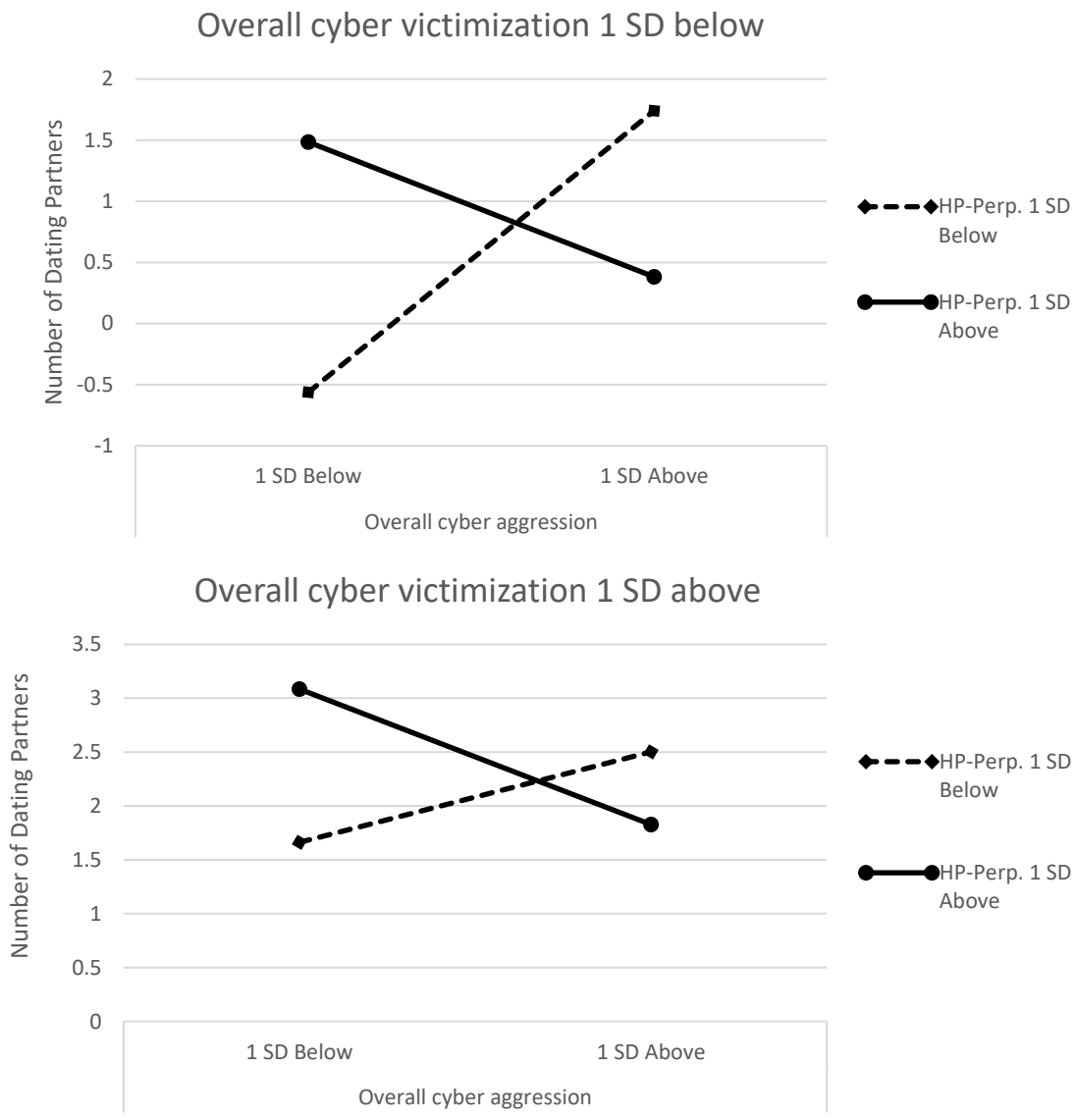

Figure 3. Frequency of overall cyber victimization and cyber aggression as moderators of the relation between high-power perpetration and number of dating partners.

but was not significantly related and negatively associated with frequent use of high-power perpetration (β = -.31, sr^2 = .00, p = .252). At high levels of cyber victimization, cyber aggression was not significantly related to number of dating partners with infrequent high-power perpetration (β = .24, sr^2 = .00, p = .247), however, the relation became significant and negative with frequent use of high-power perpetration (β = -.35, sr^2 = .01, p = .042).

Equal-power. Table 7 displays the results examining regression analyses with the 'equal' power balance variables, and shows that overall cyber victimization was again a significant predictor of number of dating partners. Furthermore, there was a negative main effect of equal-power victimization (i.e. victimization by individual with power equal to that of the respondent) within both models. While steps 3 and 4 in the overall models were non-significant, both the raw and residualized models revealed a significant two-way interaction and two significant three-way interactions. Specifically, the significant two-way interaction was for equal-power victimization by sex (raw: $t(308) = -2.28$, $p = .023$; residualized: $t(264) = -2.23$, $p = .027$). As shown in Figure 4, the relation between equal-power victimization and number of dating partners was significantly negative for females (β = -.26, sr^2 = .02, p = .006), but was not significant for males (β = .03, sr^2 = .00, p = .763).

Table 7.
Cyber aggression, cyber victimization, equal-power, and control variables in relation to number of dating partners.

		Model 1 – Raw				Model 2 - Residualized			
		β	sr^2	R^2	ΔR^2	β	sr^2	R^2	ΔR^2
Predictors									
1				.17	.17***			.17	.17***
	Age	.39***	.15			.39***	.15		
	Sex	-.13*	.02			-.13*	.02		
2				.24	.06***			.24	.07***
	CA	.03	.00			-.01	.00		
	TA					.09	.00		
	CV	.28***	.04			.36***	.03		
	TV					-.12	.00		
	EP-Perp	.06	.00			.05	.00		
	EP-Vic	-.14*	.01			-.13*	.01		
3				.25	.02			.26	.02
	CA x Sex	.13	.00			.15	.00		
	CV x Sex	.09	.00			.06	.00		
	EP-Perp x Sex	-.04	.00			-.05	.00		
	EP-Vic x Sex	-.25*	.01			-.23*	.01		
	CA x CV	-.03	.00			-.04	.00		
	CA x EP-Perp	.00	.00			-.00	.00		
	CV x EP-Vic	-.02	.00			-.00	.00		
4				.27	.02			.28	.02
	CA x CV x Sex	.29*	.01			.30*	.01		
	CA x EP-Perp x Sex	.04	.00			.02	.00		
	CV x EP-Vic x Sex	-.11	.00			-.08	.00		
	CA x CV x EP-Perp	-.02	.00			-.01	.00		
	CV x CA x EP-Vic	-.20*	.01			-.21*	.01		

Note. CA = Cyber aggression. TA = Traditional aggression. CV = Cyber victimization. TV = Traditional victimization. EP-Perp = Equal-power perpetration. EP-Vic = Equal-power victimization.
*p < .05. **p < .01. ***p <.001.

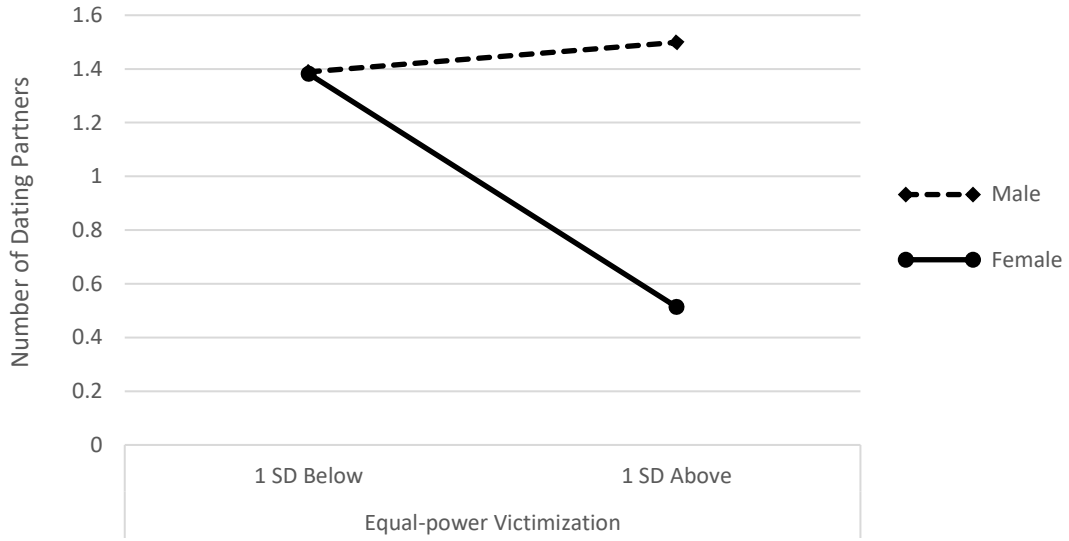

Figure 4. Biological sex as moderator of the relation between frequency of equal-power victimization and number of dating partners.

Regarding the significant three-way interactions, one significant three-way interaction was for overall cyber victimization by overall cyber aggression by equal-power victimization, as shown in Figure 5 (raw: t(303) = -2.10, p = .036; residualized: t(259) = -2.03, p = .044). Within this interaction, the relation between overall cyber victimization and number of dating partners was significantly positive with infrequent use of overall cyber aggression and frequent equal-power victimization (β = .73, sr^2 = .02, p = .011). However, this relation was not significant with infrequent overall cyber aggression and infrequent equal-power victimization (β = .34, sr^2 = .00, *p* = .109), frequent use of overall cyber aggression and infrequent equal-power victimization *(*β = .31, sr^2 = .00, *p* = .156), or frequent overall cyber aggression and equal-power victimization (β = .28, sr^2 = .00, *p* = .131).

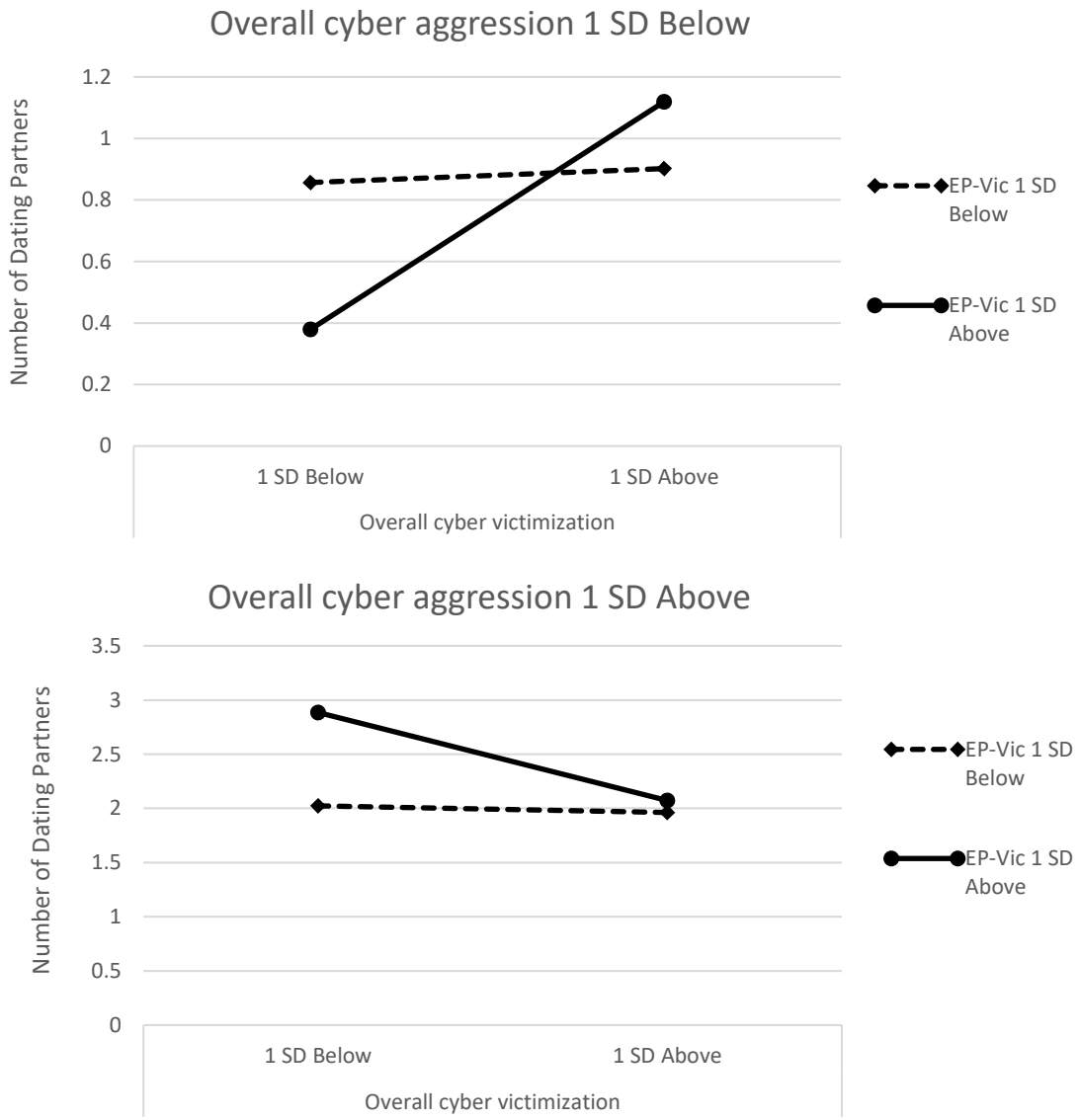

Figure 5. Frequency of equal-power victimization and overall cyber aggression as moderators of the relation between overall cyber victimization and number of dating partners.

The second significant three-way interaction involved overall cyber aggression by overall cyber victimization by sex, (raw: $t(303) = 2.02$, $p = .044$; residualized: $t(259) = 2.17$, $p = .031$). Follow-up analyses did not indicate any significant simple slopes, and it appears that the interaction may have been driven by non-significant slopes varying in terms of being in positive and negative directions.

Low-power. Table 8 displays findings for the regression analyses including the low-power balance variables, in which again it was found that overall cyber victimization, but not overall cyber aggression, was a significant predictor of number of dating partners. No other main effects or interaction terms were significant with the inclusion of the low-power moderators.

Number of sexual partners. Regarding the number of sexual partners variable, Tables 9, 10, and 11 display the findings for regression analyses including high-, equal-, and low-power balance variables, respectively. All three tables indicate that overall cyber victimization is a significant positive predictor of number of sexual partners within both the raw and residualized models. Similar to the findings for number of dating partners, equal-power victimization came through as a significant negative predictor of number of sexual partners. Finally, there were no significant interactions within any of the models predicting number of sexual partners.

Table 8.
Cyber aggression, cyber victimization, low-power, and control variables in relation to number of dating partners.

		Model 1 – Raw				Model 2 - Residualized			
		β	sr^2	R^2	ΔR^2	β	sr^2	R^2	ΔR^2
Predictors									
1				.17	.17***			.17	.17***
	Age	.40***	.16			.40***	.16		
	Sex	-.12*	.01			-.12*	.01		
2				.23	.06***			.23	.06***
	CA	.02	.00			-.03	.00		
	TA					.09	.00		
	CV	.21**	.03			.31***	.03		
	TV					-.13	.00		
	LP-Perp	.07	.00			.05	.00		
	LP-Vic	-.05	.00			-.05	.00		
3				.23	.01			.24	.01
	CA x Sex	.12	.00			.15	.00		
	CV x Sex	-.05	.00			-.07	.00		
	LP-Perp x Sex	-.03	.00			-.05	.00		
	LP-Vic x Sex	-.03	.00			-.02	.00		
	CA x CV	.00	.00			-.01	.00		
	CA x LP-Perp	-.03	.00			-.03	.00		
	CV x LP-Vic	.07	.00			.08	.00		
4				.25	.02			.26	.02
	CA x CV x Sex	.13	.00			.14	.00		
	CA x LP-Perp x Sex	.26	.00			.26	.00		
	CV x LP-Vic x Sex	-.15	.00			-.18	.00		
	CA x CV x LP-Perp	-.01	.00			-.01	.00		
	CV x CA x LP-Vic	-.10	.00			-.11	.00		

Note. CA = Cyber aggression. TA = Traditional aggression. CV = Cyber victimization. TV = Traditional victimization. LP-Perp = Low-power perpetration. LP-Vic = Low-power victimization.
*p < .05. **p < .01. ***p <.001.

Table 9.
Cyber aggression, cyber victimization, high-power, and control variables in relation to number of sexual partners.

		Model 1 – Raw				Model 2 - Residualized			
		β	sr^2	R^2	ΔR^2	β	sr^2	R^2	ΔR^2
Predictors									
1				.11	.11***			.11	.11***
	Age	.29***	.08			.29***	.09		
	Sex	-.06	.00			-.06	.00		
	Family income	-.12*	.01			-.12*	.01		
2				.16	.06***			.16	.06**
	CA	.04	.00			-.01	.00		
	TA					.09	.00		
	CV	.29***	.03			.33**	.03		
	TV					-.08	.00		
	HP-Perp	-.01	.00			-.02	.00		
	HP-Vic	-.15	.01			-.13	.00		
3				.17	.01			.18	.01
	CA x Sex	.07	.00			.08	.00		
	CV x Sex	.07	.00			.06	.00		
	HP-Perp x Sex	.09	.00			.10	.00		
	HP-Vic x Sex	-.09	.00			-.09	.00		
	CA x CV	.06	.00			.05	.00		
	CA x HP-Perp	-.05	.00			-.05	.00		
	CV x HP-Vic	.05	.00			.08	.00		
4				.19	.01			.19	.01
	CA x CV x Sex	.19	.00			.22	.00		
	CA x HP-Perp x Sex	-.03	.00			-.06	.00		
	CV x HP-Vic x Sex	.19	.00			.17	.00		
	CA x CV x HP-Perp	.04	.00			.03	.00		
	CV x CA x HP-Vic	.08	.00			.07	.00		

Note. CA = Cyber aggression. TA = Traditional aggression. CV = Cyber victimization. TV = Traditional victimization. HP-Perp = High-power perpetration. HP-Vic = High-power victimization.
*p < .05. **p < .01. ***p <.001.

Table 10.
Cyber aggression, cyber victimization, equal-power, and control variables in relation to number of sexual partners.

		Model 1 – Raw				Model 2 - Residualized			
		β	sr^2	R^2	ΔR^2	β	sr^2	R^2	ΔR^2
Predictors									
1				.11	.11***			.11	.11***
	Age	.30***	.09			.30***	.09		
	Sex	-.05	.00			-.05	.00		
	Family income	-.12*	.01			-.12*	.01		
2				.17	.07***			.18	.07***
	CA	.02	.00			-.00	.00		
	TA					.05	.00		
	CV	.30***	.04			.38***	.04		
	TV					-.12	.00		
	EP-Perp	.09	.00			.09	.00		
	EP-Vic	-.19**	.02			-.18*	.02		
3				.19	.02			.19	.01
	CA x Sex	.07	.00			.08	.00		
	CV x Sex	.09	.00			.05	.00		
	EP-Perp x Sex	-.13	.00			-.14	.00		
	EP-Vic x Sex	.05	.00			.07	.00		
	CA x CV	.06	.00			.05	.00		
	CA x EP-Perp	.06	.00			.06	.00		
	CV x EP-Vic	-.04	.00			-.02	.00		
4				.20	.01			.21	.01
	CA x CV x Sex	.11	.00			.13	.00		
	CA x EP-Perp x Sex	-.18	.00			-.21	.00		
	CV x EP-Vic x Sex	.07	.00			.10	.00		
	CA x CV x EP-Perp	.18	.00			.19	.00		
	CV x CA x EP-Vic	-.06	.00			-.08	.00		

Note. CA = Cyber aggression. TA = Traditional aggression. CV = Cyber victimization. TV = Traditional victimization. EP-Perp = Equal-power perpetration. EP-Vic = Equal-power victimization.
*p < .05. **p < .01. ***p <.001.

Table 11.
Cyber aggression, cyber victimization, low-power, and control variables in relation to number of sexual partners.

		Model 1 – Raw				Model 2 - Residualized			
		β	sr^2	R^2	ΔR^2	β	sr^2	R^2	ΔR^2
Predictors									
1				.11	.11***			.11	.11***
	Age	.29***	.09			.29***	.09		
	Sex	-.06	.00			-.06	.00		
	Family income	-.12*	.01			-.12*	.01		
2				.15	.05**			.20	.08***
	CA	.03	.00			-.00	.00		
	TA					.08	.00		
	CV	.20**	.02			.29**	.02		
	TV					-.12	.00		
	LP-Perp	.04	.00			.03	.00		
	LP-Vic	-.05	.00			-.06	.00		
3				.17	.02			.23	.03
	CA x Sex	.12	.00			.14	.00		
	CV x Sex	.07	.00			.06	.00		
	LP-Perp x Sex	-.13	.00			-.14	.00		
	LP-Vic x Sex	.03	.00			.04	.00		
	CA x CV	.13	.00			.12	.00		
	CA x LP-Perp	-.10	.00			-.10	.00		
	CV x LP-Vic	.01	.00			.02	.00		
4				.19	.02			.25	.02
	CA x CV x Sex	.13	.00			.15	.00		
	CA x LP-Perp x Sex	.13	.00			.13	.00		
	CV x LP-Vic x Sex	-.03	.00			-.06	.00		
	CA x CV x LP-Perp	-.07	.00			-.07	.00		
	CV x CA x LP-Vic	-.18	.01			-.18	.01		

Note. CA = Cyber aggression. TA = Traditional aggression. CV = Cyber victimization. TV = Traditional victimization. LP-Perp = Low-power perpetration. LP-Vic = Low-power victimization.
*p < .05. **p < .01. ***p <.001.

Discussion

The results of the present study partially support the general hypothesis that cyber aggression and victimization are linked to dating and sexual behaviour in adolescence. Specifically, it appears that adolescents who are involved with dating and sexual relationships may also be likely to engage in or be victimized by cyber aggression. Consistent with the fourth prediction and the traditional victimization findings of Volk and colleagues (2015), the results of the current study found positive associations between overall cyber victimization and number of dating and sexual partners. Since this cross-sectional study cannot determine causality, this result could indicate either a facilitative or a competitor effect, wherein experience of cyber victimization could result in more dating and sexual partners, or individuals who are involved in dating and sexual relationships are more likely to be cyber victimized within the context of intrasexual competition, respectively. While a facilitative effect of cyber victimization may be possible in cases where the form of victimization might advertise certain qualities that are preferred in short-term mating strategies (e.g. name-calling to suggest that female rivals are sexually available, as preferred by male short-term mating strategies; Buss, 2012), the lack of sex differences in the relation between cyber victimization and number of dating partners suggest that the facilitative effect is unlikely in this case.

In support of the sixth prediction, moderation analyses suggest that overall cyber victimization was more strongly, positively related with number of dating partners when the victim has frequent experience of high-power victimization (i.e. the victim is frequently targeted by less powerful peers). Additionally, the results also indicate that overall cyber victimization was significantly and positively associated with dating

partners for individuals who also reported frequent equal-power victimization and infrequent use of overall cyber aggression. These results are consistent with the competitor effect, wherein a peer who is involved in dating or sexual behaviour may be targeted by low- or equal-power peers within the context of intrasexual competition. Moreover, as discussed in the introduction, cyber media may allow for the subversion of traditional power balances, which would offer greater opportunity for low-power individuals to aggress against intrasexual competitors within the dating field, at minimal risk of harm (Kowalski et al., 2014). Thus, cyber aggression may be utilized by low-power perpetrators as an attempt to 'level the playing field' by lowering their rivals' desirability from an intersexual selection perspective, or reduce the rivals' desire and/or ability to participate in intrasexual competition. Although not predicted, since aggression may be utilized as a deterrent of victimization (Buss & Shackelford, 1997), it could be that a lack of involvement in cyber aggression may make certain individuals vulnerable to cyber victimization, as peers may perceive a decreased likelihood of retaliation, making the individual appear as an easy target.

Contrary to the fifth prediction and the expected positive effect of equal-power cyber victimization, the main effect of equal-power cyber victimization was consistently associated with fewer dating and sexual partners. Although this effect occurred in the opposite direction than predicted, it suggests, as expected, that power balance between the perpetrator and victim does explain additional variance beyond what is explained by the frequency of overall cyber victimization. Furthermore, the result could suggest either a detrimental or vulnerability effect, but the former seems more likely since the power balance had been reported as equal, and thus the victim was not necessarily vulnerable.

These conflicting findings regarding the effect of equal-power victimization may occur due to the inability to determine temporal sequence. It could be that equal-power victimization may be engendered initially by a competitor effect, but with time, become a detrimental effect, causing negative outcomes similar to those found with traditional victimization (Arnocky & Vaillancourt, 2012). Thus, longitudinal analyses may be necessary to understand the complex effect of cyber aggression and victimization amongst equal-power rivals.

Furthermore, moderation analyses indicate that equal-power victimization was negatively associated with females' dating experiences, but this was not true for males. Although this interaction should be interpreted with caution because the direction of the effect was opposite to that which was predicted, the finding is worth consideration, as the negative effect of cyber victimization is consistent with some theory and traditional victimization findings, wherein traditional victimization was negatively associated with dating behaviours for females (Gallup et al., 2011), number of sexual partners for males (Gallup et al., 2009), as well as perceived popularity and peer acceptance for both sexes (de Bruyn, Cillessen, & Wissink, 2010). Furthermore, the sex difference in this result may be related to previous findings that suggest females experience greater levels of distress associated with cyber victimization in comparison to males (Bauman, Toomey, & Walker, 2013; Bennett, Guran, Ramos, & Margolin, 2011; Cénat et al., 2014), which may cause cyber victimized females to be more likely than males to withdraw from intrasexual competition. Additionally, if cyber victimization often occurs between same-sex individuals, as has been found for traditional victimization (Gallup et al., 2009), this finding would offer indirect support to the seventh prediction, suggesting that cyber

aggression is more adaptive for females than males. Specifically, the detrimental effect of equal-power victimization amongst females may suggest that cyber aggression against equal-power rivals may cause greater harm within female intrasexual competition than in male intrasexual competition, which is consistent with females' greater reliance on indirect bullying (Wang et al., 2009) and less risky intrasexual competition strategies (Buss, 2012; Bjorklund & Hawley, 2014). However, this is speculative, as we cannot be sure of the sex of the cyber perpetrator from the data collected.

Overall, the results regarding cyber victimization appear consistent with the theorized competitor effect, which suggests that dating and sexual behaviours in adolescence may present as a risk factor for cyber victimization within the context of intrasexual competition. Additionally, the sex differences in the effect of equal-power cyber victimization suggests that females may experience greater harm from cyber victimization than males, potentially supporting the predicted stronger association between cyber aggression and reproductively-relevant behaviours for females. Finally, the differential effects of non-bullying cyber victimization (i.e. equal- and high-power victimization) emphasize the importance of examining both the frequency of cyber victimization experiences, and the power balance between individuals involved, when studying the effect of cyber victimization.

In contrast to traditional aggression and bullying findings (e.g. Arnocky & Vaillancourt, 2012; Volk et al., 2015), the results did not provide support for the first two predictions that overall perpetration of cyber aggression and high-power perpetration would independently be associated with more dating and sexual partners. However, interactions with biological sex, power balance, and cyber victimization suggest that

cyber aggression may be positively related with number of dating partners under certain conditions. Specifically, frequent bullying cyber aggression (i.e. high-power perpetration, or cyberbullying) was associated with fewer dating partners for males, but more dating partners for females. The positive relation of cyberbullying in this interaction offers partial support for the third prediction that cyber aggression would be more strongly related to reproductively-relevant behaviour when the power balance favours the perpetrator, as has been found in traditional bullying research (Vaillancourt et al., 2003; Houser et al., 2015).

Additionally, the sex difference in the interaction between overall cyber aggression and high-power perpetration offers support for the seventh prediction that the positive association between cyber aggression and reproductively-relevant behaviours would be stronger for females than males. Specifically, it seems that females may experience either a facilitative or competitor effect from their bullying cyber aggression, as frequent use of overall cyber aggression and high-power perpetration was positively associated with more dating partners for females. This result reflects many traditional bullying findings wherein bullies experience greater involvement in dating and sexual relations (e.g. Connolly et al., 2000; Vaillancourt, 2013; Volk et al., 2015). On the other hand, the results also suggest a detrimental or vulnerability effect associated with males' use of bullying cyber aggression, as their frequent use of overall cyber aggression and high-power perpetration was negatively associated with number of dating partners. This finding may be related to traditional bullying research that found that bullies tend to be low in social preference (i.e., more disliked than liked) among peers (e.g. Sijtsema, Veenstra, Lindenburg, & Salmivalli, 2009). Therefore, in regard to the present finding

that male cyberbullying is negatively related to the number of dating partners, it is possible that their bullying may have had detrimental effects on their peer relations, or conversely, that the marginalization or vulnerability implied by minimal involvement in dating made them more likely to engage in aggression.

Furthermore, correlational analyses from the present study mirror the regression findings, such that overall cyber aggression was consistently positively correlated with number of dating and sexual partners for females, but not for males. Moreover, for females, all three power balances for perpetration were positively associated with number of dating partners, and non-bullying cyber aggressive power balances (equal- and low-power perpetration) were positively associated with number of sexual partners. In contrast, for males, only low-power perpetration was significantly positively associated with number of dating partners. Thus, preliminary findings suggest that both overall cyber aggression, and more specific cyberbullying, may be more adaptive for females than males.

The sex differences in these results may be attributed to contextual differences between technology and face-to-face communications, including the inability to display certain sources of power (e.g. physical strength) and the indirect nature of the interactions that take place through cyber media (e.g. use of anonymity or through email/text correspondence). Thus, while females can use their typical bullying tactics through cyber media to display preferred qualities (e.g. social power), or derogate those of rivals, males are limited by the fact that they cannot display physical dominance through electronic devices, and therefore may lack opportunities to facilitate intersexual selection through cyber media. Moreover, although both sexes tend to utilize cyber aggression to similar

degrees (Modecki et al., 2014), females often rely on indirect traditional forms, whereas males tend to utilize both forms of traditional bullying (Wang et al., 2009). Therefore, males' use of cyberbullying may be perceived as indirect and less gender normative behaviour, which might generate greater negative peer evaluation for male cyberbullies in comparison to female cyberbullies (see Crick, Bigbee, & Howe, 1996). Alternatively, males with fewer dating partners may be more apt to use an indirect form of bullying, like cyberbullying, than males with more dating partners. Given previous cross-sectional findings showing that male physical bullying is associated with more dating partners (Dane et al., 2017), perhaps boys who are more successful in dating are able to use physical bullying as a competitive strategy, whereas those with fewer dating partners may try other more indirect forms of aggression to engage in competition.

Although not predicted, it appears that the frequency with which one is cyber victimized may affect the benefits associated with cyber aggression and cyberbullying. Consistent with the first prediction, at low levels of overall cyber victimization, non-bullying cyber aggression was positively associated with number of dating partners. However, this positive association became non-significant at high levels of overall cyber victimization. Furthermore, inconsistent with the third prediction, and therefore to be interpreted with caution, frequent cyberbullying was significantly negatively related to number of dating partners when paired with frequent cyber victimization. Therefore, the experience of cyber victimization may reduce any potential benefits associated with cyber aggression, which is consistent with traditional aggression and bullying literature that suggests that pure aggressors/bullies experience more adaptive outcomes than individuals who are both aggressors/bullies and victims (Leadbeater, Boone, Sangster, &

Mathieson, 2006; Volk et al., 2012). However, these results are inconsistent with other traditional bullying research that found that relational and physical bully-victims reported more dating partners (Dane et al., 2017; Gallup et al., 2011), which may suggest that contextual differences between traditional and cyber social spheres affects the relation between bully-victim status and dating status. Nevertheless, these results offer preliminary evidence that cyber bully-victims may be less likely to experience reproductively-relevant benefits than perpetrators of cyber aggression who are victimized less often. Furthermore, these findings add to the current research by emphasizing the importance of assessing bullying and victimization simultaneously to examine potential interactive effects on the dependent variable of interest.

In summary, it appears that cyber aggression may be most adaptive for individuals who do not often target low-power peers but rather aggress against individuals of equal or greater strength, which would be more closely related to intrasexual competition. Furthermore, consistent with predictions, the results suggest that females may reap more benefits than males from both bullying and non-bullying cyber aggression. Additionally, females are also more likely than males to be negatively affected by cyber victimization, which suggests that cyber aggression and bullying may be utilized adaptively by females in the context of intrasexual competition.

Theoretical Implications

Overall, these findings suggest that cyber aggression and victimization are associated with dating and sexual behaviours in adolescence to varying degrees. The strong positive association between cyber victimization and dating and sexual experience suggests that cyber media may be utilized in attempts to facilitate intrasexual competition

against individuals who are engaged in dating and sexual behaviours. Thus, an evolutionary psychological perspective seems applicable to this relatively new form of bullying, and the adaptiveness of cyber aggression appears to be dependent on biological sex and the power balance between the individuals within the interaction.

These findings may be applied to anti-bullying prevention and intervention programs by illuminating the fact that, like traditional bullying experience, cyber aggression and victimization are also linked to dating and sexual behaviours in adolescence. Furthermore, sex differences in the effects of cyber aggression and victimization suggest that females may be affected to a greater degree by such behaviours, and therefore may have greater risk of experiencing or perpetrating cyber aggression. Therefore, anti-bullying prevention and intervention programs should acknowledge the link between bullying behaviours and social relations in adolescence, as well as emphasize the greater risk of cyber aggression and victimization for females, in effort to effectively reduce bullying.

It is important to note that cyberbullying might function differently than traditional bullying, as cyber victimization was often positively associated with reproductively relevant behaviours for both sexes, which is contrary to traditional findings which find sex differences in relation to victimization (e.g. Gallup et al., 2009). However, these discrepant findings may arise due to contextual differences between traditional and cyber contexts. Regardless, it is important to acknowledge the association between issues such as cyber aggression and dating and sexual relationships within adolescence, as these factors may place certain individuals at risk for cyber aggression and victimization.

Limitations and Future Directions

As with all studies, the current study had some limitations. First, since this study was correlational in nature, causality cannot be determined. Therefore, longitudinal studies are recommended and currently in the works in an effort to delineate the direction of the association between cyber aggressive behaviours and dating and sexual experience in adolescence. Second, due to the sensitive and subjective nature of this study, self-reports were utilized; therefore, these findings may be subject to socially desirable responses. Future studies may benefit from utilizing peer-nominations or teacher-ratings in addition to self-report measures to corroborate aggression, victimization, and relationship data, however, this may be difficult for this particular topic, as these behaviours may not necessarily be known by many peers.

Third, anonymity of the cyber aggressive behaviours was not evaluated, nor was the biological sex of the perpetrator/victim assessed. These pieces of information would help to establish stronger theoretical ties to the evolutionary psychological perspective by contributing information regarding the overt/covert nature of the aggressive behaviour (e.g. whether peers could see or knew about the interaction), as well as whether the cyber aggressive act could be established as an intrasexual competition strategy against same-sex individuals. The fourth potential limitation of this study was the age group assessed for this particular topic, as many of the respondents in the sample had not yet had dating or sexual partners. However, longitudinal studies are currently in the works for this sample, which will allow for the assessment of changes in dating and sexual behaviours across time. Finally, the sample of respondents were primarily of Caucasian decent and from southern Ontario, which may not be generalizable to all populations of adolescents.

Conclusions

Overall, it appears that, like traditional aggression and victimization, cyber aggression and victimization are associated with dating and sexual behaviour in adolescence, suggesting that an evolutionary psychological perspective is applicable to cyber aggressive behaviours. This preliminary evidence suggests that cyberbullying does not function in the same way as traditional bullying, as frequent use of high-power perpetration may be detrimental to the perpetrator's dating experiences, at least for males and for those who frequently experience overall cyber victimization. However, the discrepant findings associated with equal-power victimization, wherein equal-power victimization has been both negatively and positively associated with number of dating partners, may be indicative of the adaptive use of cyber aggression in the context of intrasexual competition with rivals. Therefore, assessing the power balance within cyber aggressive interactions may be just as important as assessing the frequency with which aggressive behaviours occur when studying the potential benefits achieved, as well as harm experienced, from cyber aggression. It may be beneficial in future research examining bullying from an evolutionary psychological perspective to take this methodological approach.

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Appendices

Appendix A
Demographics

1. Please type in your unique Identity (ID) Number on your assent form, located below the website link: _____

2. How old are you?_____

3. Are you a boy or a girl?_____

4. What grade are you in?_____

5. Which parents do you live with at home?

a. Birth Parents
b. Adopted Parents
c. Just Mom
d. Just Dad
e. Mom and Step Dad
f. Dad and Step Mom
g. Other

6. If your parents are divorced, how long have they been divorced?_____

7. How many biological brothers do you have?_____

8. How many biological sisters do you have? _____

9. How many step/half-brothers do you have? _____

10. How many step/half-sisters do you have? _____

11. What is your ethnic/racial background?_____

12. Compared to the average Canadian, do you think your family is (circle one):

a lot less rich less rich about the same more rich a lot more rich

10. In your school, how much income inequality was there amongst the students' families?

A low amount A medium amount A high amount

11. In your neighborhood, how much income inequality is there amongst the families?

A low amount A medium amount A high amount

12. How important is being wealthy/having money to you?

Very Important Somewhat important Not very important Not at all important

13. What is the highest level of education that your mother has completed? (circle one)

a) some high school
b) finished high school
c) some college/ university/ apprenticeship program
d) finished college/ university/ apprenticeship program
e) finished a professional degree (e.g., Master's, Doctorate)

14. What is the highest level of education that your father has completed? (circle one)

a) some high school
b) finished high school
c) some college/ university/ apprenticeship program
d) finished college/ university/ apprenticeship program
e) finished a professional degree (e.g., Master's, Doctorate)

15. What is the name of your school? _____

16. In what city do you go to school? _____

17. What grade, on average, do you typically receive in school?

A (80-100%)
B (70-79%)
C (60-69%)
D or lower (59% or lower)

18. How did you find out about this study?

a) Sports team
b) Youth club (e.g., Scouts, Cadets)
c) School
d) Tutoring center
e) Other club (e.g., art, drama)
f) Other _____

Appendix B
The Aggression, Bullying, and Victimization Measure

BULLYING
Physical

In the PAST YEAR, how often have **YOU DONE** the following?

Response Scale: Never, Once or Twice, Several Times, Almost Every Month, Almost Every Week

1. Deliberately damaged or broke someone's things
2. Got into a physical fight
3. Hit, kicked, or shoved someone
4. Used a weapon (e.g., sticks, rocks, knife, gun) to fight someone
5. Physically hurt others
6. Used physical force against someone
7. Tripped or threw things at someone
8. Pinched, pulled hair, or scratched others

Context: (i.e., function, balance of power, repetition)

How often have YOU DONE the things listed above (i.e., hitting, fighting, breaking things etc.) for the following reasons?

Response Scale: Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

Proactive and Reactive
1. To be cool or popular, or to feel powerful or respected
2. To get others to do what I want
3. To show others not to mess with me
4. To get back at someone for something they did to me a while ago
5. To take things from others
6. Just for fun or excitement
7. To show off and impress the opposite sex
8. To damage someone's reputation
9. To compete with someone for a boyfriend or girlfriend
10. To defend myself, in the heat of the moment, because someone threatened or hurt me
11. Others made me frustrated and I acted before calming down
12. Someone made me angry and I reacted without thinking
13. Others did something wrong to me and I reacted without thinking
14. To stick up for, or fit in with, a group

Balance of Power/Repetition

15. How often have you done the things listed above (hitting, fighting, physically hurting etc.)…
    a. to someone who had **LESS** strength, popularity, or power than you?
    b. to someone who had **ABOUT THE SAME** strength, popularity, or power as you?
    c. to someone who had **MORE** strength, popularity, or power than you?
16. How often have you done the things listed above (hitting, fighting, physically hurting etc.) to someone repeatedly, so that they happened again and again?

Verbal

In the PAST YEAR, how often have **YOU DONE** the following?

Response Scale: Never, Once or Twice, Several Times, Almost Every Month, Almost Every Week

1. Threatened to physically hurt someone
2. Said mean things or made fun of someone in a hurtful way
3. Put others down or called them mean names
4. Teased someone in a hurtful way
5. Embarrassed or made someone look stupid in front of their friends
6. Made unwanted sexual jokes, comments, or gestures
7. Threatened to spread private information about someone
8. Threatened to exclude or leave someone out of a group or activity

Context: (i.e., function, balance of power, repetition)

How often have YOU DONE the things listed above (i.e., threatened, said mean things etc.) for the following reasons?

Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

Proactive and Reactive
1. To be cool or popular, or to feel powerful or respected
2. To get others to do what I want
3. To show others not to mess with me
4. To get back at someone for something they did to me a while ago
5. To take things from others
6. Just for fun or excitement
7. To show off and impress the opposite sex
8. To damage someone's reputation
9. To compete with someone for a boyfriend or girlfriend
10. To defend myself, in the heat of the moment, because someone threatened or hurt me
11. Others made me frustrated and I acted before calming down
12. Someone made me angry and I reacted without thinking
13. Others did something wrong to me and I reacted without thinking

14. To stick up for, or fit in with, a group

Balance of Power/Repetition

15. How often have you done the things listed above (threatened, said mean things etc.) …
    a. to someone who had **LESS** strength, popularity, or power than you?
    b. to someone who had **ABOUT THE SAME** strength, popularity, or power as you?
    c. to someone who had **MORE** strength, popularity, or power than you?
16. How often have you done the things listed above (threatened, said mean things etc.) to someone repeatedly, so that they happened again and again?

Relational

In the PAST YEAR, how often have **YOU DONE** the following?

Response Scale: Never, Once or Twice, Several Times, Almost Every Month, Almost Every Week

1. Spread negative rumours about someone
2. Gossiped (not in a friendly way) about others
3. Told someone's secrets to others
4. Told my friends to stop liking someone
5. Kept someone out of my group of friends
6. Ignored, stopped talking to, or acted cold toward someone
7. Left out or excluded someone from a group or activity
8. Told others hurtful lies about someone
9. I try to steal others friends from them

Context: (i.e., function, balance of power, repetition)

How often have YOU DONE the things listed above (i.e., spread rumours, excluded someone etc.) for the following reasons?

Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

Proactive and Reactive
1. To be cool or popular, or to feel powerful or respected
2. To get others to do what I want
3. To show others not to mess with me
4. To get back at someone for something they did to me a while ago
5. To take things from others
6. Just for fun or excitement
7. To show off and impress the opposite sex
8. To damage someone's reputation

9. To compete with someone for a boyfriend or girlfriend
10. To defend myself, in the heat of the moment, because someone threatened or hurt me
11. Others made me frustrated and I acted before calming down
12. Someone made me angry and I reacted without thinking
13. Others did something wrong to me and I reacted without thinking
14. To stick up for, or fit in with, a group

Balance of Power/Repetition

15. How often have YOU DONE the things listed above (spread rumours, excluding someone etc.) …
    d. to or about someone who had **LESS** strength, popularity, or power than you?
    e. to or about someone who had **ABOUT THE SAME** strength, popularity, or power as you?
    f. to or about someone who had **MORE** strength, popularity, or power than you?
16. How often have you done the things listed above (spreading rumours, excluding someone etc.) to someone repeatedly, so that they happened again and again?

Cyber

In the PAST YEAR, how often have YOU DONE the following?

Response Scale: Never, Once or Twice, Several Times, Almost Every Month, Almost Every Week

1. I spread rumours or gossip about someone, using the internet or a cell phone
2. I told hurtful lies about someone, using the internet or a cell phone
3. I used the internet or a cell phone to make fun of and say mean things to someone
4. I used the internet or a cell phone to send or post embarrassing information, pictures, or videos of someone
5. I threatened someone using the internet or a cell phone
6. I pretended to be someone else, in a mean or hurtful way, using the internet or a cell phone
7. Sent unwanted sexual jokes, comments, or pictures, using the internet or a cell phone
8. Ignored or stopped responding to someone, using the internet or a cell phone
9. Kept someone out of my group of friends, using the internet or a cell phone

Context: (i.e., function, balance of power, repetition)

How often have YOU DONE the things listed above (i.e., used the internet or cell phone to spread rumours, threaten etc.) for the following reasons?

Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

Proactive and Reactive
1. To be cool or popular, or to feel powerful or respected

2. To get others to do what I want
3. To show others not to mess with me
4. To get back at someone for something they did to me a while ago
5. To take things from others
6. Just for fun or excitement
7. To show off and impress the opposite sex
8. To damage someone's reputation
9. To compete with someone for a boyfriend or girlfriend
10. To defend myself, in the heat of the moment, because someone threatened or hurt me
11. Others made me frustrated and I acted before calming down
12. Someone made me angry and I reacted without thinking
13. Others did something wrong to me and I reacted without thinking
14. To stick up for, or fit in with, a group

Balance of Power/Repetition

15. How often have you done the things listed above (used a cellphone or the internet to spread rumours, post or send embarrassing things about someone etc.) …

g. to or about someone who had **LESS** strength, popularity, or power than you?

h. to or about someone who had **ABOUT THE SAME** strength, popularity, or power as you?

i. to or about someone who had **MORE** strength, popularity, or power than you?

16. How often have you done the things listed above (used a cellphone or the internet to spread rumours, post or send embarrassing things about someone etc) to someone repeatedly, so that they happened again and again?

VICTIMIZATION

Physical

In the PAST YEAR , how often have the following things **BEEN DONE TO YOU**?

Response Scale: Never, once or twice, several times, almost every month, almost every week

1. Someone deliberately damaged or broke my things
2. Someone hit, kicked, or shoved me
3. Someone used a weapon (e.g., sticks, rocks, knife, gun) to attack me
4. Someone physically hurt me
5. Someone used physical force against me
6. Others tripped or threw things at me
7. Others pinched, pulled hair, or scratched me

Context: Balance of Power/Repetition

Response Scale: Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

1. How often have the things listed above BEEN DONE TO YOU….
    a. by someone who had **MORE** strength, popularity, or power than you, so that you had trouble defending yourself?
    b. by someone who had **ABOUT THE SAME** strength, popularity, or power as you?
    c. by someone who had **LESS** strength, popularity, or power than you?
2. How often has someone done the things listed above to you repeatedly, so that they happened again and again?

Verbal

In the PAST YEAR , how often have the following things BEEN DONE TO YOU?

Response Scale: Never, once or twice, several times, almost every month, almost every week

1. Someone threatened to physically harm me
2. Others said mean things or made fun of me
3. Others put me down or called me hurtful names
4. Someone teased me in a mean way
5. Others embarrassed me or made me look stupid in front of friends
6. Someone made unwanted sexual jokes, comments, or gestures to me
7. Someone threatened to spread private information about me
8. Someone threatened to exclude or leave me out from a group or activity

Context: Balance of Power/Repetition

Response Scale: Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

1. How often have the things listed above BEEN DONE TO YOU….
    a. by someone who had **MORE** strength, popularity, or power than you, so that you had trouble defending yourself?
    b. by someone who had **ABOUT THE SAME** strength, popularity, or power as you?
    c. by someone who had **LESS** strength, popularity, or power than you?
2. How often has someone done the things listed above to you repeatedly, so that they happened again and again?

Relational

In the PAST YEAR , how often have the following things BEEN DONE TO YOU?

Response Scale: Never, once or twice, several times, almost every month, almost every week

1. Others spread rumours about me
2. Others gossip about me
3. Someone told my secrets to others

4. Others told my friends to stop liking me
5. Others kept me out of a group of friends
6. Someone ignored or stopped talking to me, or acted cold toward me
7. Others left me out or excluded me from a group or activity
8. Others told hurtful lies about me

Context: Balance of Power/Repetition
Response Scale: Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

1. How often have the things listed above BEEN DONE TO YOU….
    a. by someone who had **MORE** strength, popularity, or power than you, so that you had trouble defending yourself?
    b. by someone who had **ABOUT THE SAME** strength, popularity, or power as you?
    c. by someone who had **LESS** strength, popularity, or power than you?
2. How often has someone done the things listed above to you repeatedly, so that they happened again and again?

Cyber

In the PAST YEAR , how often have the following things BEEN DONE TO YOU?
Response Scale: Never, once or twice, several times, almost every month, almost every week

1. Others spread rumours or gossip about me, using the internet or a cell phone
2. Someone told hurtful lies about me, using the internet or a cell phone
3. Someone used the internet or a cell phone to make fun of me and say mean things about me
4. Someone used the internet or a cell phone to send or post embarrassing information, pictures, or videos of me
5. Someone threatened me using the internet or a cell phone
6. Someone pretended to be me, in a mean or hurtful way, using the internet or a cell phone
7. Someone sent unwanted sexual jokes, comments, or pictures, using the internet or a cell phone
8. Others ignored or stopped responding to me, using the internet or a cell phone
9. Others kept me out of a group of friends, using the internet or a cell phone

Context: Balance of Power/Repetition
Response Scale: Never, Hardly Ever, Sometimes, Fairly Often, Almost Always

1. How often have the things listed above BEEN DONE TO YOU….
a. by someone who had **MORE** strength, popularity, or power than you, so that you had trouble defending yourself?
b. by someone who had **ABOUT THE SAME** strength, popularity, or power as you?
c. by someone who had **LESS** strength, popularity, or power than you?
2. How often has someone done the things listed above to you repeatedly, so that they happened again and again?

Appendix C
Revised Dating and Sex Questionnaire

Please answer these questions about dating, love, and romantic relationships among teenagers. Dating is going out or spending time with girls (boys) you like, love, or have a crush on. Boys and girls can spend time together in many ways. Answer the questions below, to describe the types of ways you spend time together with girls (boys) after school and on weekends.

1. How often do you go to activities or events (e.g., parties, movies, sports events), after school or on weekends, with both boys and girls?

(Never, Hardly Ever, Sometimes, Quite a Bit, Very Often)

2. How often do you go on dates with a girl/boy, but with a group of people?

(Never, Hardly Ever, Sometimes, Quite a Bit, Very Often)

3. How often do you go on dates with a girl/boy, just the two of you?

(Never, Hardly Ever, Sometimes, Quite a Bit, Very Often)

4. How many different people have you gone on dates with, just the two of you? _____

5. How interested are you in dating right now?

(not at all, a little, a little interested, somewhat interested, interested, very interested)

6. Do you have a girlfriend/boyfriend right now? _____

7. How long have you been going out with your current girlfriend/boyfriend? _____

8. How often do you spend time after school or on weekends with your current girl(boy)friend?

(Once a month or less, Once a week, A few times a week, Once a day)

9. How satisfying or positive is your relationship with your current girlfriend/boyfriend?

(Not at all satisfying, slightly satisfying, somewhat satisfying, satisfying, very satisfying)

10. How many girlfriends/boyfriends have you had? _____

11. How long do you usually go out with a girlfriend/boyfriend before you break up?

(about a week, about a month, a few months, 6 to 12 months, more than a year)

12. What is the longest period of time that you have ever gone out with a particular girlfriend/boyfriend? _____

13. How satisfying or positive have your previous relationships with girlfriends/boyfriends typically been?

Not at all satisfying, slightly satisfying, somewhat satisfying, satisfying, very satisfying)

14. If you do not have a girl(boy)friend right now, would you like to have one in the near future?

- I don't care much about girl(boy)friends right now.
- I'd like to have a girl(boy)friend but it's not that important right now.
- I would really like to have a girl(boy)friend right now.

15. How many different partners have you had a voluntary sexual experience with (i.e., more than kissing or making out) since the age of 12? _____

16. Thinking of voluntary sexual experiences that you have had since the age of 12 (i.e., more than kissing or making out), how old were you when you had this first sexual experience? _____

17. How many different girlfriends/boyfriends have you had a voluntary sexual experience with (i.e., more than kissing or making out) since the age of 12? _____

18. Since the age of 12, with how many different partners have you had voluntary sexual experiences without having an interest in a long-term committed relationship with this person?

19. How satisfying or positive have the voluntary sexual experiences (i.e., more than kissing or making out) that you have had since the age of 12 been?

(Not at all satisfying, slightly satisfying, somewhat satisfying, satisfying, very satisfying)

20. I can imagine myself being comfortable and enjoying "casual" sex (i.e., more than kissing or making out) with different partners.

(Response Options: Strongly Disagree, Disagree, neither agree nor disagree, agree, strongly agree)

21. I do not want to have sex (i.e., more than kissing and making out) with a person unless I am sure that we will have a long-term, serious relationship.

(Response Options: Strongly Disagree, Disagree, neither agree nor disagree, agree, strongly agree)

Appendix D

Adolescent Relationships Parental Form

Please keep this form for your records.

Principal Investigator:
Dr. Anthony Volk, Professor
Department of Child and Youth Studies
Brock University
905-688-5550 xt. 5368
tvolk@brocku.ca

INVITATION

Your son/daughter has been invited to participate in a study that involves research into adolescent relationships. The purpose of this study is to better understand how adolescent relationships in one domain (e.g., parents) influence their relationship in another (e.g., personality, school, or peers). What follows are the specific goals of the study.

We are interested in exploring factors associated with adolescent social relationships including personality, peer relationships, and school factors. For instance, we are interested in how an adolescent's individual traits, such as personality, influence the likelihood that they will be a bully and/or a victim. So far, no one has looked at most of these factors in teenagers, and no one has looked at the combination of all these factors. We believe that answering these questions will give us a much better idea of what factors are involved in adolescent social relationships. We would like to note that a small number of the questions are about violence, sexual activity and related behaviors.

WHAT'S INVOLVED

As a participant, your son/daughter has been asked to fill out questionnaires about themselves, their friends, their peers, their parents, and their basic demographics (e.g., age) on an online survey website. Participation will take approximately 45-50 minutes of their time. Only the researchers will see these responses, and the only ties to participant names will be a unique Identification (ID) number that will be used to confirm participation so that participants can receive $15 cash for participating. The ID number will not be linked to any other responses to the questionnaires. They will only be linked to participant names on the consent forms, which will be stored separately in a filing cabinet separate from questionnaire responses. The original consent form, which includes the unique identification number, will only be removed from the filing cabinet in the event that the participant chooses to withdraw from the study. In such an event, the removed identification number will be used to identify the participant's response in the questionnaire database, and the data will be deleted.

POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include getting to know their own relationships better, and learning more about adolescent relationships in general through reflection on some of the participants' own relationships. There also may be risks associated with participation in that some relationships are stressful to think about. If they find any part of this study to be stressful, they may contact the researcher, the Brock University Ethics board, or simply stop their participation. We also tell your son/daughter that "[they] may also freely discuss the study with parents or friends if [they] need to, although we would ask that [they] try not to talk to someone before [they] complete the study on [their] own (e.g., don't share answers until both have completed the study). Sharing answers before the study ends can complicate and/or change their own natural answers. We do not ask any specific questions regarding specific incidents, **so there are no issues of personal or legal liability for any of your son/daughter's answers, nor are we legally obligated to disclose any of their answers (including abuse or harm) to our questions.**

All participants will be offered $15 cash for their participation. They will receive this payment once the completed forms are returned. Once receiving the $15, participants will have to sign a sheet for our records indicating you have received the payment.

CONFIDENTIALITY

Participants in this study will only be identified by a unique number that is tied to a master list kept by Dr. Volk. You, or they, may request the withdrawal of their data from the study within 5 years of their participation. Unique, identifiable data (such as date of birth, names) will not be collected.

As a parent, you will have to consent to your son/daughter's participation, **but you will not gain access to their answers. You may only control whether WE are able to view their answers or not by providing or withdrawing your consent**. *We feel that it is very important for the participants in our study to be able to know that their answers are completely confidential.* This will hopefully encourage them to be as honest as possible so we can really understand what is going on in their relationships. To this end, we again ask that you don't discuss the study with your son/daughter until they have completed it in order to avoid biasing their answers. Once the study is completed (i.e., after they have filled in and handed in the forms), you may of course discuss any related topic you feel fit. In the final form explaining the study, we encourage participants to talk to people whom they trust (including parents) about any related issues.

Data collected during this study will be stored on a secure computer and hard copies of forms will be kept in a locked filing cabinet. Data will be kept for five years, after which time the data will be deleted. Access to this data will be restricted to Dr. Volk and his collaborators, who have signed confidentiality agreements. Parents, friends, and participants will not have access to any individual data, although they may have access to the overall study results.

The researchers will own all data collected through Qualtrics and therefore all information will be confidential. Qualtrics data are temporarily stored in the United States and therefore is subject to the Homeland Security or Patriot Act. However, data will be downloaded daily on a secured Canadian server onto a password protected lab computer. Once data is downloaded in the lab, the data will be immediately deleted off from Qualtrics.

VOLUNTARY PARTICIPATION

Your teenager's participation is voluntary. They need not participate, even if you give parental consent. There are no organizational or personal consequences for not participating other than not receiving the $15. **Again, as a parent, you do NOT have access to your adolescent's individual results. You control whether or not we are able to view them by providing or withdrawing your consent for their participation.** In the event of withdrawal, data will be confidentially destroyed.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available by late Spring or Early Summer on Dr. Volk's research web page (http://www.brocku.ca/volk-developmental-science-lab).

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions or concerns about this study, please contact the study coordinator, Dr. Volk, using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University #15-173. If you have any comments or concerns about the study ethics, or your adolescent's rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

If you have any concerns about your adolescent participating as a bully, or being a victim of bullying, please feel free to discuss the matter with other parents, teachers, friends, and/or any trusted individuals. For advice on how to talk to your teen or other individuals about bullying, we recommend www.bullying.org, http://www.lfcc.on.ca/bully.htm, and the Niagara Youth Connection (905-641-2118 ext. 5592). You may also feel free to contact me, Dr. Anthony Volk, at tvolk@brocku.ca (905-688-5550 ext. 5368) with any related questions or concerns.

Thank you for your help in this project!

Please keep this form for your records.

Appendix E
Adolescent Relationships

Principal Investigator:
Dr. Anthony Volk, Professor
Department of Child and Youth Studies
Brock University
905-688-5550 xt. 5368
tvolk@brocku.ca

INVITATION
You are invited to participate in a study on adolescent relationships. The purpose of this study is to better understand how adolescent relationships are influenced by various aspects of their personal and social lives, such as personality, school, peers, and parents. We would like to note that a small number of the questions are about violence, sexual activity and related behaviors.

WHAT'S INVOLVED
As a participant, you will be asked to fill out questionnaires about yourself, your social group, and your basic demographics (e.g., things like age, who you live with, etc.) online using the link provided for Qualtrics, a questionnaire website. It should take you about 45-50 minutes to complete the forms. You will need to complete these questionnaires in one sitting. If you close the website or stop in the middle, there will be no way to return to the questionnaire. Only the researchers will see these responses, and the only ties to participant names will be a unique Identification (ID) number that will be used to confirm participation so that you can receive $15 cash for participating. The ID number will not be linked to any other responses to the questionnaires. They will only be linked to participant names on the consent forms, which will be stored separately in a filing cabinet separate from questionnaire responses. The original consent form, which includes the unique identification number, will only be removed from the filing cabinet in the event that the participant chooses to withdraw from the study. In such an event, the removed identification number will be used to identify the participant's response in the questionnaire database, and the data will be deleted.

POTENTIAL BENEFITS AND RISKS
Possible benefits of participation include getting to know your own relationships better, and learning about adolescent relationships in general through reflection on some of your own experiences. There also may be risks associated with participation. Some relationships are tough to think about. If you find any part of this study to be stressful, you may contact the researcher, the Brock University Ethics board, or simply stop your participation. You may also freely discuss the study with parents or friends if you need to, although we would ask that you try not to talk to someone before they complete the study on their own (e.g., don't share answers until both of you have completed the study unless you feel it's really necessary). Sharing answers before the study ends can distort and/or change your own natural answers.

We do not ask for any specific incidents or events, so **there is no personal or legal liability associated with any of your answers, nor are we legally obligated to disclose any of your answers to our questions (including abuse and harm)**. If you have any concerns about specific behaviours or incidents, we strongly suggest that you discuss them with trusted individuals. These individuals could be parents, teachers, friends, or other trusted adults. You may also contact the Kids Help Phone at: http://www.kidshelpphone.ca/en/ (1-800-668-6868). It is important to know that you do not need to tolerate any form of abuse!

You will receive $15 cash for your participation in this study. You will receive this payment once you have completed the questionnaires and returned the consent and assent forms. Once receiving the $15, you will have to sign a sheet for our records indicating you have received the payment.

CONFIDENTIALITY

You will only be identified by a unique number that is tied your name. There is no way for anyone to identify the data beyond this number. Unique, identifiable data (such as exact date of birth, name, names of friends and family) will not be collected. Your parents will have to consent to your participation, **but they will not be able to read your answers** (*although they can request that any such data be deleted*). You also do not have to reveal your answers to any of your friends, peers, or anyone else other than the researchers in this study. The only exception is that Dr. Volk will have a copy of your consent form, with your participation number, stored in a password protected computer in his lab, so that you can later request that your data be removed from the study if you wish. No other individual will have access to this link to your name, and Dr. Volk will ONLY access this information if you contact him asking to remove your data from the study within 5 years. Your name or ID will in no other way be involved with the data analysis or presentation.

Data collected during this study will be stored on a secure computer. Data will be kept for five years, after which time the data will be deleted or shredded. Access to this data will be restricted to Dr. Volk and his collaborators, who have signed confidentiality agreements. Your parents, friends, participants, and coaches will not have access to any individual data, although they may have access to the overall study results. So you do not have to worry about anyone finding out your answers, or about anyone following up on your answers, or about any consequences of the answers you provide. Your responses will be confidential and the only links between your name and ID number will be stored separately from your questionnaire responses, with access only by Dr. Volk.

In order to best protect your confidentiality, we suggest completing the online questionnaires in private and on your own. This will limit the possibility of others (e.g., parents, siblings, friends) from seeing your responses.

The researchers will own all data collected through Qualtrics and therefore all information will be confidential. Qualtrics data are temporarily stored in the United States and therefore is subject to the Homeland Security or Patriot Act. However, data will be downloaded daily on a secured Canadian server onto a password protected lab computer. Once data is downloaded in the lab, the data will be immediately deleted off from Qualtrics.

VOLUNTARY PARTICIPATION

Participation in this study is purely voluntary. Whether you participate, or what questions you answer, is completely up to you. If you want to withdraw from this study at any time, you may do so without any penalty other than not receiving the $15 and your data will be confidentially destroyed in the event of withdrawal. This research is not linked to your organization, so there is no organizational penalty if you do not participate. If you would like to withdraw your data after you have completed the study, you must provide your unique identification number as it is the only way we have to identify your data. Please keep your ID number attached to this sheet in a safe place in case you wish to withdraw from the study.

However, before you can participate in this study, you MUST obtain parental consent. If you are reading this form, you should have already obtained parental consent. If you haven't, please provide your parents with the appropriate forms immediately. If you do not provide parental consent, you may NOT participate in this study. Again, your parents will not have direct access to your answers, but they do control whether WE are able to see your answers or not. If your parents do provide consent, you are not obligated to participate. That is your own decision. So you need their consent to participate, but that consent doesn't force you to participate.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available by late Spring or Early Summer on Dr. Volk's research web page (http://www.brocku.ca/volk-developmental-science-lab).

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Dr. Volk using the contact information provided above. You can also use this contact information if you have any questions

about what the questionnaires mean, or if you need any help completing the questionnaires. If you have any questions while you are filling out the forms, please feel free to contact Dr. Volk. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University # 15-173 VOLK. If you experience any stress while participating in this study, please refer to debriefing form for a list of agencies you may contact.

If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

LINK TO QUALTRICS
If you are interested in participating, please follow this link to the Qualtrics website and use the following password to proceed:

Link: **https://goo.gl/LWcMKK**

Your ID number:

Thank you for your help in this project!

Please keep this form for your records.

Appendix F
CONSENT FORM

I agree to allow my teen to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time and request that my son/daughter's data be removed from the study.

Name: _____

Signature: _____ Date: _____

Do you agree to allow your teen to be contacted via e-mail and participate in follow-up studies in the future?

Yes: _____
No: _____

Please return this form.

Appendix G

ASSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Assent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this assent at any time.

Name: _____

Signature: _____ Date: _____

ID number:

Would you like to be contacted for follow-up studies in the future?

Yes: _____
No: _____

If Yes, please provide your e-mail address:
_____

Please return this form.